The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

VOL. VIII. No. 206 MAY 26, 1923 Prepaid Annual Subscription United Kingdom, £1.1.0; Abroad, £1.6.0.

Contents

	PAGE
EDITORIAL: Our Trade Abroad: Professor Bone's Combustion Theories; Activated Nitrogen; The Merchant Point of View; Electronic Theory of Valency	557
The Manufacture of Acids and Alkalis	560
Correspondence	562
Society of Glass Technology	563
Economic and Financial Conditions in Germany	564
Trade Conditions in Norway	567
Chemical Production in Canada	568
The Development of Empire Trade	570
Two Reports on Shipping Conditions	571
From Week to Week	573
References to Current Literature	574
Patent Literature	575
Market Reports and Current Prices	576
Company News: Trade Inquiries	582
Commercial Intelligence	584

NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

The prepaid subscription to THE CHEMICAL AGE *is 21s. per annum for the United Kingdom, and 26s. abroad. Cheques, Money Orders and Postal Orders should be made payable to Benn Brothers, Ltd.*

Editorial and General Offices—8, Bouverie St., London, E.C.4

Telegrams: "Allangas, Fleet, London." Telephone: City 9852 (6 lines).

Our Trade Abroad

IN the development of our trade in foreign markets the merchant shipper has been a potent factor in the past, and though the larger manufacturers have latterly taken to the habit of handling their own products, his influence promises to be potent in the future. His function is much wider than that of merely importing foreign goods and reselling at a profit. He acts as general agent for customers in practically every market in the world, and it is very much to the advantage of this country that the consumer in South America, the Far East, or the Colonies should look to some merchanting house in England to supply his varied needs and see that the goods are assembled and shipped without the personal trouble he would otherwise incur. Not only does this process employ home labour and circulate British productions, but it results in the exchange of commodities with the importing markets and the maintenance of our mercantile marine service. Moreover, it tends to confirm the position of Great Britain as a world centre in finance and commerce, and even the British manufacturer who acts as his own merchant gains indirectly from these international trade connections.

Concurrently with this recognition of the importance of the merchant shipper, we have seen a marked development on the production side of chemical industry. Whether we take heavy chemicals, fine chemicals, dyestuffs, or chemical plant, the emphasis to-day is placed on production. In some cases, as in dyestuffs, production has already developed so far that the discovery of markets abroad for surplus output must be one of the needs of the near future. Here, again, the merchant-trader should find employment for his enterprise. Many of the larger manufacturing concerns already recognise his usefulness by utilising his services as agent, and the smaller ones, not sufficient in size to justify an independent sales department, are still more in need of such help. Generally speaking, the chemical trade of the country is not unsatisfactory, but the increase in volume is not quite as rapid as some had anticipated. The improvement, however, has been steady and sound, and compared with the position of most competing nations we have more cause for congratulation than for lament.

Professor Bone's Combustion Theories

As a pioneer the name of Professor Bone would have lived had he contributed to science nothing further than his theories in connection with the pyrogenetic decompositon of the hydrocarbons which appeared in the transactions of the Chemical Society exactly fifteen years ago. Since then, however, he has added in no small measure to our knowledge of the theories of combustion and the correct utilisation of fuel, and although there are many who differ from him when it comes to the practical exposition of some of his ideals it cannot be doubted that he has given us much to think about and has set our minds working in almost unlooked-for directions. At the Royal Institution recently Professor Bone clearly illustrated the manner in which high-temperature combustion work is opening up new possibilities of extending knowledge; and, as an example of the potentiality of high-pressure explosion research to reveal and elucidate new factors in gaseous combustion, he dealt with the cases of hydrogen and carbon monoxide which present features of exceptional interest and complexity, features which for many years chemists have vainly endeavoured to explain.

Those who have studied the Professor's remarks and who are interested in the scientific explanation of combustion phenomena must feel that he has advanced not only a fascinating but an extremely probable theory to account for the somewhat enigmatical behaviour of carbon monoxide on combustion. In the first place it has been determined that nitrogen does not, as is so commonly supposed, stand aside and play no part in the sequence of events, but in a totally unexpected manner it acts as an energy absorber, and when explosion occurs it imparts what perhaps we may call a delaying action. Thus, in the explosion of

a mixture of carbon-monoxide and air the pressure energy is developed with comparative slowness as compared with a hydrogen-air mixture. Another fascinating theory is that which is advanced in connection with the influence of hydrogen or steam upon the combustion of carbon monoxide. Since the publication (also in the Chemical Society's transactions) of the theories of Rhead and Wheeler on the mechanism of the combustion of carbon we have become used to dealing with the formation of " complexes," and now Professor Bone introduces us to something else of the same nature which he characterises as unstable and vibratory and to which he assigns the formula of H_4O_2. Accordingly, we are making the acquaintance of something quite new in theories relating to CO and its behaviour under ordinary circumstances.

Activated Nitrogen

APART from Professor Bone's theoretical conceptions, he draws out our interest at times with certain side allusions which immediately focus our attention on industrial issues. Firstly, for instance, we are reminded—although we knew it before—that a flame of carbon monoxide burning in air loses by radiation nearly two and a half times as much energy as a hydrogen flame of the same size. This fact necessarily throws back our minds to the recent suggestions which have been made (and which were referred to in these columns last week) for the provision of a gas for general purposes free from what is called " poisonous " carbon monoxide. We believe we are not mistaken, too, in saying that Professor Bone himself has been a fairly relentless critic of the CO in towns' gas, and yet he is showing us that for nearly all industrial purpose we have in CO a constituent which is two and a half times more useful than hydrogen.

The second instance in which Professor Bone's imagination proves extremely fascinating is when he tells us of the activation of nitrogen by the combustion of carbon monoxide at high pressures, hydrogen being excluded as far as possible from the system. We seem to perceive herein some relation between these suggestions and development on the lines of the well-known Haüsser process, and as the latter has not as yet made any commercial progress in this country, it is quite possible that by activating the nitrogen in the manner suggested we may eventually arrive at quite an alluring proposition for the production of nitric acid and combined nitrogen in general. Blast-furnace gas apparently provides an almost unlimited supply of just the right kind of raw material required, and it will be wise for us to take heed of Professor Bone's warning that the new possibilities should be thoroughly explored at home, and not left to foreign organisations, which probably will not be slow to seize on them.

The Merchant Point of View

OVERSEAS trading in dyestuffs and chemicals, according to an authority on the merchant position who has given us his views from that standpoint, continues extremely difficult. " With regard to dyestuffs," he writes, " the merchant interest has been most severely penalised by the operations of the Dyestuff Act, and, indeed, both importing and exporting are made almost impossible by the way in which both the Dyestuff Act and the Safeguarding of Industries Act are administered. Connections and goodwill—established in some cases by generations of trading—are either totally ignored or placed in an impossible position. Indeed, it is not an uncommon experience to find that supplies can be obtained from newcomers in the trade at prices below the official prices. The effect of these two Acts is practically destroying the export trade, and important business that formerly came to this country is now diverted to the Continent and to America. It is highly probable that attention will be called at an early date in the House of Commons to the whole working of these Acts, including the Central Importing Agency phase. In the meantime traders in dyestuffs and chemicals in Belgium, Holland and Italy are getting the trade that ought to come here, and Britain is losing both prestige and profit.

" Business in dyestuffs and chemicals with Russia," he continues, " was showing signs of marked expansion when the Curzon Note introduced doubt and uncertainty which may well lead to throwing Russia more than ever into the arms of Germany. If wiser councils had prevailed, instead of money being still payed in unemployment doles, many of the unemployed might have been profitably engaged in making and despatching goods urgently needed in Russia, and we might have been receiving regular supplies from Russia of goods that would have been very useful and profitable."

Electronic Theory of Valency

WE are asked to make a preliminary announcement regarding the general discussion on this subject, which is being arranged by the Faraday Society, and is to be held at Cambridge on July 13 and 14. Professor G. N. Lewis will open the proceedings on the Friday afternoon with a general introductory address, and he will probably be followed by Mr. R. H. Fowler, who will contribute a paper intended to open discussion on the physical and inorganic side of the subject. Among those expected to speak are Sir J. J. Thomson, who will be in the chair, Sir Ernest Rutherford, Sir William Bragg, and Professor W. L. Bragg. The Saturday morning session will be devoted chiefly to applications of the theory in organic chemistry. Sir Robert Robertson, President of the Society, will preside, and opening papers will be given by Professor T. M. Lowry and Dr. N. V. Sidgwick. Among those expected to speak are Professor W. A. Noyes, Sir William Pope, Professor A. Lapworth, Professor I. M. Heilbron, Dr. W. H. Mills, Professor J. F. Thorpe, and Professor R. Robinson. On the Friday evening a complimentary dinner will be given to Professors Lewis and Noyes and other guests at Trinity Hall. Arrangements are being made to accommodate those attending the meeting in one or other of the colleges, and it will be possible to include a limited number of non-members of the Society. Particulars may be had from the Secretary of the Faraday Society, 10, Essex Street, London, W.C.2, to whom applications should be made at once.

Chemical Tariff Mission to England

A MISSION, consisting of three delegates, is at present in this country on behalf of the United States Tariff Commission to investigate the costs of production of five chemicals manufactured in England and Europe. The members are Mr. Carl R. DeLong, chief of the chemical division of the Commission, Mr. M. G. Donk, and Mr. E. M. Whitcomb. The chemicals they have to inquire into are barium peroxide (England), sodium nitrite (Germany and Norway), potassium chloride (Scandinavia and Germany), oxalic acid (Germany and Holland), and veronal (Germany and Switzerland). Under the provisions of the Tariff, the President of the United States is empowered, on the recommendation of the Tariff Commission, to vary the tariff on individual substances to the extent of 50 per cent., either increase or decrease. Applications for such increases have been received from United States importers, consumers, and manufacturers, and in regard to European manufacturers the present deputation is inquiring into the costs of production in order to advise the Commission in their decisions. The delegates speak very well of their reception in England. They arrived here on Sunday, May 13, and will probably leave at the end of this week for Norway and Germany, and after completing their inquiries there and in Switzerland expect to sail for the United States from Cherbourg some time in July.

In some discussion as to the effects of the Tariff, Mr. DeLong informs us that, contrary to expectation, imports into America, instead of declining, have rapidly advanced since the Tariff came into operation, until they considerably exceed the exports. The only explanation of this abnormal situation is that America has a sufficient stock of gold and is taking payment in the form of goods to much more than the usual extent.

Cost of Newspaper Production

ON and after June 4 the price of *The Times* will be 2d., and the *Daily Telegraph* announces a similar change. As publishers of some dozen weekly newspapers we are in a position fully to understand the necessity for this action. For those inside the newspaper industry the decision needs no justification, for all the London daily papers are now sold at double their pre-war price, and this by no means equals the rise in publishing costs. Proprietors who are determined to maintain their publications at a high level of excellence and to give their readers a complete and accurate news service are faced with the following facts. Paper used in the printing of a journal is now more than double its 1914 price; wages stand at more than three times their pre-war figure; carriage, distribution, and postage charges are more than double those of 1914. These are the main charges, but among the miscellaneous items which are charged to the cost of producing a newspaper it would be difficult to find one which can be obtained for less than twice what was asked for it eight years ago. The proprietors both of *The Times* and of the *Daily Telegraph* are to be congratulated on their courage. These two papers maintain the highest standards of daily journalism, and it would have been unfortunate if the proprietors had decided to lower those standards.

Points from Our News Pages

"The Manufacture of Acids and Alkalis" is dealt with in a review by Mr. P. Parrish, A.I.C. (p. 560).

Letters are published on "Research into Dyestuffs," and "Revaluation of Property" (p. 562), and also on "Non-Poisonous Gas" (p. 568).

A summary is given of a new official report on "Financial and Economic Conditions in Germany" (p. 564).

The state of trade in Norway, with special reference to chemicals, is discussed (p. 567).

An account is given of the conditions of chemical production and trade in Canada (p. 568).

According to our London Market Report business continues quiet, with some export demand (p. 578).

Business in the Heavy Chemical Market remains quiet with firm prices, according to our Scottish Market Report (p. 580).

Books Received

THE CHEMISTRY OF THE INORGANIC COMPLEX COMPOUNDS. By Dr. Robert Schwarz. New York: John Wiley and Sons, Inc. London: Chapman and Hall, Ltd. Pp. 82. 8s. 6d.

QUALITATIVE ORGANIC ANALYSIS. By Oliver Kamm. New York: John Wiley and Sons, Inc. London: Chapman and Hall, Ltd. Pp. 260. 12s. 6d.

ANNUAL REPORTS OF THE SOCIETY OF CHEMICAL INDUSTRY ON THE PROGRESS OF APPLIED CHEMISTRY, 1922. Vol. VII. London: Society of Chemical Industry. Pp. 586.

PHYSICS IN INDUSTRY. By Archibald Barr, Sir James Alfred Ewing and Clifford C. Paterson. London: Henry Frowde and Hodder and Stoughton. Pp. 59. 2s. 6d.

The Calendar

May 31	Royal Institution of Great Britain: "The Nature of Enzyme Action." Sir Wm. M. Bayliss. 3 p.m.	21, Albemarle Street, Piccadilly, W.1.
31	Royal Society: Papers by Dr. E. Griffiths, Dr. G. W. C. Kaye, Professor E. F. Armstrong, etc. 4.30 p.m.	Burlington House, Piccadilly, W.1.
June 4	Society of Chemical Industry (London Section): "The Stream-Line Filter." Dr. H. S. Hele-Shaw. 8 p.m.	Burlington House, Piccadilly, W.1.
6, 8 and 12	University of London: "The Structure and Behaviour of the Molecule." Professor Gilbert N. Lewis. Lecture. i.—The Structure of the Molecule (Atomic and Molecular Statics). ii.—The Colour of Substances. iii.—The Sources of Chemical Affinity (Atomic and Molecular Dynamics). 5 p.m.	University College, Gower Street, London, W.C.1.
20 to 23	Society of Chemical Industry: Annual Meeting.	Cambridge.
22	Society of Chemical Industry: Presentation of the Society's Medal to Dr. C. C. Carpenter. 11 a.m. Address by Dr. F. W. Aston on "Isotopes." 2.30 p.m.	Arts School, Cambridge.

The Manufacture of Acids and Alkalis*

By P. Parrish, A.I.C.

THE name of Lunge will be indelibly associated with the development of the heavy chemical industry. This circumstance is not alone due to his unique achievement in the compilation of many encyclopædic volumes of an eminently practical character, having reference to various branches of this industry, but in no small degree to the *rôle* he played in the discoveries and improvements which led to its consolidation.

The first English edition of Lunge's *Sulphuric Acid and Alkali* was published in 1879. Since that time four edition have appeared, the last one in 1913, followed in 1917 by a supplementary volume on sulphuric and nitric acids. It was generally known that the supplementary edition signalised the close of Dr. Lunge's long and distinguished literary labours in this sphere, and that age and failing health prevented him from undertaking the preparation of further editions. The volumes now under notice are the first to appear under the editorship of Dr. Alex. C. Cumming, who is responsible for the perpetuation of Lunge's work and tradition.

Quite wisely, the new editor has appreciated the necessity of sectionising the various branches constituting the sulphuric acid and alkali industry, and of allocating special subjects to separate authors. This procedure is especially commendable in view of the important changes which have occurred during the last ten years (viz.: the disappearance of the Hargreaves and Leblanc processes), and the trend of modern developments. To Mr. Wilfrid Wyld—who has been connected, as manager and engineer, with several chemical works producing sulphuric acid by the chamber process—has been assigned the task of revising Lunge's treatise, having reference to the manufacture of sulphuric acid and sulphur dioxide, and Volume I. deals essentially with the raw materials, etc., in this connection.

Foundation of the Chemical Industry

It is generally conceded that the manufacture of acids and alkali is the foundation of the whole chemical industry. Whether this broad statement will be equally true a decade hence is open to doubt. The future trend of international development is likely to lead nations to concentrate their energies in an attempt to become increasingly self-supporting. This will entail an appreciable growth of agriculture, and it is not inconceivable that the fixation of atmospheric nitrogen, the production of synthetic ammonia, the conversion of ammonia to nitric acid, and its combination with gaseous synthetic ammonia as nitrates—in short, the nitrogen industry, may be the keystone of chemical activities in the future. One is impelled to the foregoing prediction by a perusal of the introduction to the volume in question.

Chapter 1 is appropriated to historical and general notes on the manufacture of sulphuric acid, a subject of intense interest. When it is recalled that it is less than two centuries since the manufacture of vitriol was commenced in this country (at Richmond, near London) on a working scale, when glass vessels of 66 gallons capacity were used, one can form some reasonable conception of the changes which have been wrought in industrial operations of a chemical character since that time.

In Chapter 2 we are introduced to a consideration of the raw materials in the manufacture of sulphuric acid, prior place being given to sulphur, presumably because it was the original raw material from which sulphuric acid was made. The subject matter appears to have been well revised and brought up to date. There is a wealth of information concerning the properties and characteristics of sulphur, its colloidal and allotropic modifications, which one feels sure is not common knowledge. The section dealing with sulphur obtained from various materials is divided into eight different headings, and is, on the whole, satisfactorily treated. Justice has hardly been done to sulphur in spent oxide, in view of the large amount of investigation work undertaken during the war. No mention is made of the fractional crystallisation of the sulphur from the crude carbon bisulphide extract as a satisfactory method of purification from tarry matter, nor is there any allusion to the Hood process in this connection. Interesting information is furnished concerning the refining of sulphur, and the production of roll, block and flowers of sulphur.

Whether technical analyses and methods of sampling, to which 44 pages are devoted in this chapter, could not be more usefully incorporated in Lunge-Keane's *Technical Methods of Chemical Analysis*, is a matter which needs consideration, especially when it is remembered that some of the methods indicated are not entirely beyond criticism.

The subject matter having reference to pyrites, which is covered under several headings, is commendably clear, and to the point, but this can scarcely be said anent spent oxide from gas works—an aspect which is capable of, and deservedly merits, fuller treatment.

The Use of Nitrogen Oxides

Eminently practical information is afforded on the subject of the production of oxides of nitrogen to the sulphuric acid process by the four different methods usually in vogue. The more recent practice of supplying nitrogen oxides via plant for the oxidation of ammonia is suitably treated, but the relative merits and chief considerations of the latter process as contrasted with "potting" have been stated in more detail and with greater cogency (*vide* THE CHEMICAL AGE, Vol. VII., 165, pp. 200–1; pp. 266–8) than is indicated in the author's statement on page 174 of the volume under review.

Chapter 3 covers 130 pages, and comprises such subjects as the properties and analysis of sulphur sesquioxide, sulphur dioxide, sulphur trioxide, pure "monohydrated" sulphuric acid, sulphuric acid containing water, in addition to which valuable sections follow on the influence of impurities on the density of aqueous sulphuric acid, the solubility of SO_2 in sulphuric acid, and the physiological action of sulphuric acid.

The subject matter in relation to the action of sulphuric acid on metals has been recast and modernised, and will repay careful study. Despite all the available date bearing upon the methods recommended for determining the suitability of chemical sheet lead for various purposes, there is a consensus of opinion that further research is necessary.

The behaviour of sulphurous and sulphuric acid towards oxides of nitrogen, and the properties of oxides of nitrogen and nitrogen-sulphur compounds are appositely dealt with in this chapter.

We are led essentially to works problems and considerations in Chapter 4, where the production of sulphur dioxide from (*a*) sulphur; (*b*) pyrites; (*c*) zinc blende and other sulphides; (*d*) from various materials, such as spent oxide, hydrogen sulphide, etc.; (*e*) noxious vapours; (*f*) blast furnace slag; and (*g*) other methods, is discussed in considerable detail. Interspersed between the subject matter under these sectional headings are to be found descriptions of sulphur burners, pyrites lump and smalls burners, zinc blende burners, and spent oxide burners, all being of the hand and mechanical types, together with valuable practical notes on how several of the burners are put into operation, and the considerations necessary to ensure efficient control.

Obviously, in a chapter embracing 195 pages, it is impossible to give more than an outline of the various aspects dealt with. It may, however, be said that much new matter has been introduced, all of which, generally speaking, is of a valuable practical character.

More illustrations could, with advantage, have been furnished, and equally, the inclusion of some of the practical points relating to mechanical burners, which are alone revealed as a result of continued experience, would have enhanced the value of this section.

Take the Wedge mechanical burner in order to elucidate what is implied. There are four or five important points to which attention must be given if fool-proof operation of this burner is to be ensured. In the first place, the refractory material must be highly satisfactory. Bricks or special tiles

* *Raw Materials for the Manufacture of Sulphuric Acid and the Manufacture of Sulphur Dioxide.* By Wilfrid Wyld. London: Gurney and Jackson. Pp. 538. 36s. *The Manufacture of Hydrochloric Acid and Saltcake.* By Alexander C. Cumming. London: Gurney and Jackson. Pp. 423. 31s. 6d.

must not be made from a too plastic clay. They should be "burnt" at a temperature of about 1400° C. German bricks have been found eminently satisfactory for the top three shelves. The construction of the camber arches constituting the shelves is a vital factor, and too much attention cannot be directed to this aspect. All the bricks or tiles must be hammered "home." Joints exceeding one-sixteenth of an inch must be forbidden. In the working of the burner, violent fluctuations of temperature should be avoided, and caking should not be allowed on the upper hearths. Practice suggests that the sheer pin usually provided as a safety emergency against arm and other such breakages is not sufficiently delicate to respond to disturbances of this order. The writer would prefer to rely on the fusing of a four-ampère lead fuse wire, connected between the terminals of the motor switch box. Thirty thousand gallons of water per day are required for cooling the arms of a 20-ton Wedge mechanical burner. In this connection it is important that the water should not be circulated to such a degree as to cause undue concentration of the calcium salts, otherwise their deposition will be promoted, and the water passages of the arms will become blocked, and cause trouble.

Two sizes of Wedge mechanical burners are made, having the following characteristics :—

Name.	Capacity per day.	Weight of bricks.	Weight of iron and steel work.
Alpha	11 tons pyrites smalls.	120 tons.	42 tons.
Delta	20 tons pyrites smalls.	200 tons.	52 tons.

A tabulation of the mechanical burners principally used in this country, embodying the above information, together with details of the diameter, and number of shelves, would have been particularly serviceable.

The author's suggestion that "On account of the insulation of the shaft it is not much hotter inside the shaft than immediately adjacent to the shell of the furnace, and an arm can be changed in a hot furnace in less than an hour's time," would have been qualified had the author had occasion to remain inside a shaft during the renewal of an arm.

Spent Oxide

The section dealing with burners for spent oxide could have been usefully extended. There are at least four types of hand-spent oxide burners, irrespective of the one with which the author deals, all of which possess distinctive features. Some of these types are not based on the counter-current principle of air travel in relation to the hand movement of the oxide. Some of these burners ensure much more complete combustion than others, and obviously the chemical properties of the residue vary fairly widely in consequence.

In dealing with the production of pure liquid sulphur dioxide by the Schroeder and Haenische process, no reference is made to the necessity for the removal of sulphurous acid, nor to the importance of dehydrating the SO_2, etc., gases by passage through strong sulphuric acid—actual operations carried out at works in this country making this product. This chapter is finally completed by valuable information concerning draught-pipes and flues, dust chambers, and electrical precipitation of dust, composition of burner gas, and the composition of flue-dust and chamber deposits. The 49 pages dealing with the latter feature will justify careful study, and the author is to be complimented on the excellent way in which the matter has been submitted.

It is interesting to record here that the writer removed on an average 100 tons of dust per year from a modified Howard's dust chamber working in conjunction with a 20-ton Wedge mechanical burner. This dust consisted largely of $FeHSO_4$, which deliquesces rapidly. Seventy-five per cent. of this dust was soluble in water, the balance being mica and silica. The insoluble matter contained 0·3 per cent. of insoluble copper, representing only 0·075 per cent. insoluble copper in the original dust.

The final chapter (No. 5) of this volume deals with the disposal of pyrites cinders, in connection with which processes for the briquetting and sintering of purple ore receive due notice. The Greenawalt system is cited, and the writer confidently predicts that this method will be very largely adopted in future.

The extraction of copper from pyrites cinders occupies 23 pages, and although one or two articles on this subject have appeared (*vide Gas World*, Coking Section, July and November, 1919), to which no allusion is made, the information collated and recorded by the author, and the data furnished, constitute a very valuable contribution to the knowledge of the subject. This remark equally applies to the subject matter relating to the treatment of copper precipitate, extraction of silver and zinc, the recovery of sodium sulphate, and the treatment of ores poor in copper.

No reference is made to the financial aspect of copper extraction—a subject of pre-eminent importance in these days, when it has been impossible satisfactorily to adjust the question of returning charges in this connection.

It is hoped that the comments of the writer on Volume 1 will prove helpful and stimulating in the preparation of any future edition. They are not intended to detract from the outstanding value and merit of Mr. Wyld's revisionary work, which it is fully appreciated has been of a formidable nature. Indeed, it is doubtful whether the task could have been more creditably undertaken by any other person. Obviously, omissions of the character indicated are inevitable, but the noticeable errors appear to be singularly few.

The writer unhesitatingly recommends the purchase of the book, recognising, as he does, that it contains eminently useful and practical information not hitherto included in any other edition or work.

Hydrochloric Acid and Saltcake

Dr. Alex. C. Cumming, the editor of the new series of books on acids and alkalis, has himself undertaken the task of revising Volume 5, dealing with the above subject. Indeed, in contrasting the previous volume with the one just published it is seen that it has been remodelled and re-written, and that much polemical matter, of very little utility in these days, has been expunged.

Chapter 1 deals with the properties and composition of sodium chloride, sodium sulphate, and hydrochloric acid.

Chapter 2 deals essentially with the raw materials and products of manufacture of saltcake and hydrochloric acid, and their analysis.

It is observed that no reference is made to the suitability of salt for specific purposes. For instance, fine, dry salt is to be preferred for the chloridising roasting of pyrites cinders, whereas a granular type of salt is an advantage in the manufacture of hydrochloric acid and saltcake. It has been found that a suitable specification of salt for this manufacture is as follows :—

> 99 per cent. to pass a ¼ in. mesh screen.
> 95 per cent. to remain on a 20 by 20 mesh screen.

This contemplates optimum porosity consistent with minimum crystal size.

Chapter 3 comprises 88 pages, indicating the type of plant, and the general considerations governing the manufacture of hydrochloric acid and saltcake from salt and sulphuric acid. Broadly speaking, where a superfine quality of saltcake is desired, mechanical furnaces are to be preferred, but where a high strength hydrochloric acid is desired, undoubtedly, a Deacon's muffle furnace assists largely in securing this desideratum.

In connection with the observations on plus-pressure furnaces, it is interesting to observe that in subsoils, which are largely waterlogged, where it is impracticable to build a comparatively deep furnace shaft, the same object can be attained by constructing an ordinary gas producer with primary and secondary air supplies and by using a regulus metal fan (in many ways this is preferable to an earthenware fan), for ensuring a partial vacuum in the acid-gas flue. The writer has found that oval fireclay retorts, halved at the ends, and covered with a broad iron band at the joints, are infinitely preferable to brick gas flues. They can be made definitely tight, and free from fume.

Chapter 4 has reference to various processes for the manufacture of sulphate of soda saltcake as a principal product from common salt, and the information furnished is of peculiar interest. Quite apart from the Six and Guttmann furnace, which is known to operate advantageously, hydrochloric acid and saltcake of good quality have been produced from nitre cake and salt, by employing a saltcake pot and open hearth

furnace, taking steps to ensure efficient cooling of the gases before absorption in the towers.

Contrary to the remarks made in the paragraph dealing with the neutralisation of nitre cake, it is known to the writer that considerable quantities of excellent saltcake have been made from nitre cake and Magadi soda by suitable grinding.

Chapter 5 deals admirably with the manufacture of sulphate of soda by the process of Hargreaves and Robinson, but inasmuch as this method has fallen into desuetude, this chapter does not call for special notice.

Chapter 6 deals with the manufacture of pure sodium sulphate, and Glauber's salt, but does not embody many new facts.

Chapter 7 deals in a commendable way with the absorption of hydrochloric acid, and much revised data on the evolution of heat, the necessity for cooling prior to absorption, the absorption problem, and the evolution of hydrochloric acid during the manufacture, are covered by the chapter in question, in approximately 19 pages. It is noticed that Miss K. A. Burke's translation of Thomsen's Thermal Chemistry is frequently quoted, and one compliments the author on having recourse to this book, which has been found to be very useful in many ways.

As regards the absorption problem, the writer would affirm that effective cooling is essential outside the towers, which should function as absorbers, and not as coolers. The valuable general theory of gas absorption in packed towers by Donnan and Masson is quoted, and merits careful consideration when the design and packing of any absorption tower of the type under discussion is contemplated.

As affecting the evolution of hydrochloric acid gas from a charge of salt and sulphuric acid, the writer has made many determinations, and has reached the conclusion that by reason of the irregularity of the evolution of HCl, it would be possible to attach *two* furnaces and pots in connection with most normal condensing systems, provided the time of introducing the charge to the pots is alternated. By operating in this way, the water flush to the towers could be maintained uniformly, and stronger hydrochloric acid could be secured.

Much practical information in respect of the general arrangement of plant, conducting pipes, stone cisterns, Woulfe's bottles, coke towers, the erection of stone condensing towers, etc., is furnished in the remaining 93 pages, and it is certain that works managers and chemical engineers will frequently refer to this information and data.

Chapter 8 deals essentially with the manufacture of synthetic hydrochloric acid, but it is regretted that only five pages are assigned to this recent development. This chapter is somewhat disappointing.

Chapters 9 and 10 cover respectively (*a*) The manufacture of hydrochloric acid by other than the ordinary methods; and (*b*) weak acid; control of condensation; yield, cost, purification, pumping and conveyance of hydrochloric acid, all presented in a very suitable manner.

It may be said unhesitatingly, that Dr. Cumming has been judicious in discarding certain controversial matter, and that the re-casting and re-writing of one or two of the chapters has materially added to the utility of this volume.

Beyond doubt, the Lunge tradition of providing current information of an eminently practical and useful character has been fully maintained, and Dr. Cumming is to be congratulated on the success of his effort, both as author and editor.

Research into Dyestuffs

To the Editor of THE CHEMICAL AGE.

SIR,—With regard to the recent work on the "Antiseptic Properties of Dyestuffs," by T. F. Fairbrother and H. Renshaw, I should like to point out that the idea of the utilisation of such properties in dye-stuffs is by no means novel, and that I carried out a considerable amount of research work in this field myself nearly 20 years ago, although on somewhat different lines.

I published in the *Journal of the Society of Dyers and Colourists* in December, 1902, a paper on "The Chemical Action of Light on Dyed Colours," in which I gave the results of the resistance to sunlight of a very large number of direct cotton dye-stuffs, many of which were prepared specially by myself for this work.

As pointed out in a later paper, "Some Remarks on the Chemical Action of Sunlight on Dyed Fabrics," read before the Society of Dyers and Colourists in August, 1910, the object I had in view was to determine whether there was any relation between the antiseptic properties of dyestuffs and their resistance to sunlight. I have always been of the opinion that the destructive action of sunlight on dyed fabics is not due to simple oxidation, but depends on the intermediary action either of some form of bacteria, or perhaps unorganised ferments (enzymes). In order to test this theory I prepared a large number of direct cotton dyestuffs, using particularly the strongly antiseptic phenol and salicylic acid, as compared with other substances which, so far as is known, are not actually antiseptic, such as various amido-naphthols and derivatives of the naphthols and naphthylamines.

I claim to have proved in this paper of December, 1902—and I may say that the actual work was commenced before the year 1900—that direct cotton colours derived from phenol and its homologues and their sulphonic and carboxylic acids are extremely fast to light. On the other hand the colours derived from phenols containing two or more hydroxy groups such as resorcinol, are extremely loose to light, and if my theory is correct, this is due to the fact that dyestuffs from monohydric phenols act on the bacteria or whatever causes the action of light, whereas dyestuffs from resorcinols, which are not so strongly antiseptic as phenols, have not this protective influence. In the same way direct cotton colours derived from alpha and beta naphthylamines and their sulphonic acids are loose to light, and the same applies to colours from alpha and beta naphthols. On the other hand colours from some of the amido-naphthols and their sulphonic acids are fast to sunlight, whilst other similar acids are extremely loose. Thus, for example, it is a very curious fact that a direct cotton colour prepared from benzidine and 2 : 8 : 3 : 6 amido-naphthol disulphonic acids is comparatively fast to light, whereas when prepared from the 1 : 8 : 3 : 6 acid the colour is loose. There seems to be no reasonable explanation of this from the point of view of the chemical constitution of dyestuffs, and I sought to prove that this difference is in reality due to the different antiseptic properties of the dyestuffs, whether it be benzidine, tolidine, or dianisidine, or other similar compound, seems to play little part.

Unfortunately I was compelled to give up this work on the chemical action of sunlight on dyed fabrics, but I am still convinced that the action is due to either bacterial or enzymic causes, although of course there is always the possibility of catalysis. In any case, so far as my experiments went, there is no question that the whole reaction is extremely complicated, and Messrs. Fairbrother and Renshaw have undoubtedly entered upon a very fruitful field of research.—Yours, etc.,

DAVID BROWNLIE.

46, Grange Road, Ealing, W.5.
May 22, 1923.

Re-Valuation of Property

To the Editor of THE CHEMICAL AGE.

SIR,—The proposals of the Chancellor are chiefly machinery amendments, but the real issue—the basis of increase—remains untouched. This is the vital point, particularly to owner-occupiers, for in other cases it is possible to find some basis in the rentals paid, however faulty such a basis may be at present. In my own practice I find the real cause of complaint lies, not in an actual increase, but in the excessive amount of such increase.

It must be remembered that the rent increases were intended largely to meet the high cost of repairs, and, where the owner of property has actually expended thereon more than the normal statutory allowance, he may claim the further allowance given in respect of repairs, maintenance, insurance and management of property. On the other hand it behoves the tenant to see that the assessment value is not greater than the rent, otherwise he will suffer Income Tax on the excess, which he cannot recover from the landlord. Moreover, an unjustifiable increase in such value will raise his House Duty above the normal.

The position generally emphasises the soundness of the proposal to allow taxpayers to be represented by persons fully conversant with Income Tax matters so that their interest may be properly protected.—Yours etc.,

W. R. FAIRBROTHER.

67–68, Cheapside,
London, E.C.2.

Society of Glass Technology

Annual Meeting and Dinner

At the annual dinner of the Society of Glass Technology on Wednesday, May 16, Professor W. E. S. Turner, Sheffield, the president, indicated certain directions in which the Society was extending its influence.

The Society held its annual general meeting during the day, when the following papers were read: on "The refractive index changes in optical glass occasioned by chilling and tempering," by Messrs. F. Twyman and F. Simeon; "Notes on burettes," by Mr. Verney Stott; "A new method of glass melting," by Mr. A. Ferguson; "The drying out and warming up of glass furnaces," by Mr. C. Saxton; and "Natural sillimanite as a glass refractory," by Mr. S. English.

At the dinner at the Hotel Cecil in the evening, Professor Turner was in the chair, and among those present were Sir Frank Dyson, Astronomer Royal; Mr. H. J. C. Johnston, Leeds, president of the Institute of Clayworkers; Mrs. Turner, Sheffield; Mr. and Mrs. F. Wood, Barnsley; Mr. S. B. Bagley, Knottingley; Colonel Halse, Castleford; Dr. W. W. Travers, past president of the Society; Mr. W. J. Gardner, Huddersfield, Master of the Glaziers' Company; Mr. E. A. Hailwood, Leeds; Mr. G. Simpson, Castleford; Mr. F. G. Clark, Sheffield; M. Courty, Paris; Mr. S. English, Sheffield, secretary of the Society, and Mrs. English.

Seeking Bendable Glass

Mr. H. J. C. Johnston proposed the toast of the Society, and in the course of a humorous speech said he had heard a man complain that inventors had never re-discovered the secret of bendable glass. The first man who discovered bendable glass was, according to this man, executed by the king of his time. He (the speaker) had asked his son to look up glass in the Leeds University library to give him tips for his speech, and he had received a passage from a text-book which said the unbreakable glass was made forty years ago by immersing it in a red-hot state in a bath of paraffin. (Laughter.) But apparently glass-makers of to-day had forgotten how to do it. (Laughter.) Imagine, he said, what would happen if someone brought in a refractory material which would last for ever. He thought immediately of some of his friends in the pottery industry, who eked out a precarious living on broken cups and saucers. (Laughter.) Dr. Turner's name was a household word wherever the glass industry was known, and he was quite sure that in electing him President the Society had made a wise and prudent move. (Applause.)

Professor Turner, in response, declared that there had been far more practical invention in the glass industry than that of unbreakable glass. One of them, which was appreciated at any rate in his household, was that of baking dishes in glass. In America they were carrying this development to a very great extent. The wide nature of the Society's work had been referred to, but they were still indefinite as to what glass was. The glass industry before the war was not a definite entity, but now they had the pleasure of knowing that there had developed a corporateness or sense of corporateness that did not exist in 1915, and for that they were grateful to the Society.

Referring to the desire to extend the Society's influence, Dr. Turner said the Council had decided to admit at a reduced subscription casual and clerical workers in the industry. By that they hoped to stimulate their workers, and so improve the industry. As to the future, he hoped that glass manufacturers would decide to make a big show at the 1924 exhibition. The 1851 exhibition showed what England could do, and there was no reason why they should not repeat that at the 1924 exhibition.

Dr. Travers proposed the health of the visitors, and Sir F. Dyson replied.

Abstracts of Papers at the Meeting

Messrs. F. Twyman and F. Simeon, in their paper on "The Refractive Index Changes in Optical Glass Occasioned by Chilling and Tempering," detailed experiments upon a dense barium crown glass and a borosilicate crown glass, the first being made by Chance and the second by the British Scientific Instrument Research Association, although actually the work covered a number of optical glasses embracing most types used for components of optical systems and including some extra flint glasses used in spectroscopy. The experiments consisted in finding the change of refractive index caused by cooling the glass as quickly as possible without shattering the glass, and the rate of recovery and the amount of recovery were then determined at each of three different temperatures, the specimen being raised to the chosen temperature by an electric furnace and kept at that temperature for a given length of time.

The Use of Burettes

In his paper on "Burettes," Mr. Verney Stott, of the National Physical Laboratory, went into exhaustive detail in regard to methods of testing and graduating burettes, and pointed out that the two main sources of error in the use of burettes were that the burette reading changed with the length of time which elapsed between closing the stopcock and taking the reading, and that variations in the rate of emptying the burette caused variations in the volume of water delivered. The first source of error might be practically eliminated by making the delivery time sufficiently long, and delivery times had been selected both by the N.P.L. and the American Bureau of Standards. The errors arising from the second source mentioned, viz., variations in the time of flow, were also made comparatively small by using burettes having delivery times in accordance with the N.P.L. regulations. Burettes fulfilling the conditions specified for Bureau of Standards or N.P.L. standard burettes might be used, without following any rigid method of procedure, and the volume of liquid delivered would be practically independent of such variations in manipulation, as were often found necessary by the chemist. All the above related to water, although in actual use a burette was rarely used to measure volumes of water. From certain results which had been obtained on alcohol and strong sulphuric acid, the conclusion had been reached that should it be desired to measure volumes of concentrated sulphuric acid from a burette, the burette should be calibrated with acid of the strength desired. It had also been ascertained that German standard burettes were much less reliable in actual use than either the Bureau of Standards or N.P.L. standard burettes owing to the much greater errors to which they were liable if the conditions of use departed in any way from the conditions of test. On the whole, however, a burette which had been calibrated with water might be used without risk of serious error for the majority of dilute aqueous solutions used in volumetric analysis.

New Method of Glass Melting

Mr. A. Ferguson, in presenting his paper on a "New Method of Glass Melting," confessed he was not a glass maker, but having devoted himself for many years to mining, engineering and the chemistry and treatment of ores, he had applied that knowledge to the development of a type of glass melting tank called the Cyclone, the theory of which was that the batch to be melted was brought down to a very fine mesh and whirled around in a gaseous atmosphere in a furnace of V shape, the effect being that molecules of molten glass were thrown to the sides of the furnace and run down to the bottom. It was claimed that in this way a better glass can be made at a cheaper cost than with the older methods.

A short paper followed by Mr. S. English on experiments which he has carried out upon sillimanite as a refractory material for glass pots. In an ordinary glass pot at a certain temperature there was formed on the surface a substance known as sillimanite which had very much better qualities as a refractory material, this formation preventing corrosion of the glass making materials. The melting point of sillimanite is about 1,800° C., and certain attempts had been made to prepare sillimanite artificially in order that it might be used as the substance in which to melt glass instead of the usual clay. Mr. English had been able to secure samples of sillimanite from certain deposits of it as a natural product, and a large number of experiments were carried out to ascertain if the usual difficulties which the glass manufacturer encountered with pot clay were also encountered with pots made of this natural sillimanite. Tests were made side by side with crucibles made of pot clay mixtures of the Stourbridge class. It was found that the shrinkages of sillimanite on firing were much less than are usually encountered with pot clay, the total shrinkage figures being of the order of 10·4 per cent. in the case of clay and 2·8 per cent. in the case of sillimanite. Further, the corrosion of the glass was claimed to be much less with sillimanite than with ordinary pot clay, samples of glass from pot clay crucibles exhibited being very much more deeply coloured than the glass melted in sillimanite, thus indicating, said Mr. English, that the attack by clay was very much greater.

Economic and Financial Conditions in Germany

Trade Review to March, 1923

The "Report on the Economic and Financial Conditions in Germany," by Mr. J. W. F. Thelwall (Commercial Secretary to H.M. Embassy, Berlin), assisted by Mr. C. J. Kavanagh (Commercial Secretary to the Occupied Territories, Cologne), published by the Department of Overseas Trade (pp. 158, 4s., post free 4s. 2½d.), is of more than usual interest as it brings the review of German conditions up to March of this year. The following extracts are taken from it.

THE dominant features in a review of the financial and economic situation of Germany during 1922 are, as in previous years, inflation and reparations, but they have obtruded themselves to a much greater degree, they have at times been nearer to a solution, and, as is only natural with the lapse of time, their effects have become more marked.

Reparations

At the beginning of 1922 the schedule of payments of May 5, 1921, was still in force which provided for two milliard gold marks p.a., plus a variable annuity of 26 per cent. of the value of German exports. At the same time, however, Germany stated that she could not fulfil these conditions any longer, and in March the Allies decided that during the year Germany's cash payments should be reduced to £36,000,000, payable in instalments, and that deliveries in kind not exceeding £72,500,000 in value should also be made. On July 12, 1922, the German Government asked for a moratorium, a request which was refused by the Reparations Commission, but as the amounts outstanding were, by virtue of her right of priority, due to Belgium, it was left to her to arrive at an arrangement with Germany. This she did by agreeing to accept six months' bills for a total of 270,000,000 gold marks (£13,500,000), to be delivered in instalments from August 15 to December 15, 1922, and which will, therefore, fall due from February 15 to June 15, 1923.

A number of official, semi-official and private agreements were concluded between the Allies and Germany for regulating and facilitating deliveries in kind; no record as to the extent of the transactions under these agreements is available, but it would seem that while comparatively little was done with France and Belgium, the orders for rolling-stock and locomotives for Portugal, Roumania, and Jugo-Slavia are considerable.

On October 21, 1922, Germany was granted further alleviation by an arrangement suspending all payments under the clearing system until July, 1923; as these payments had amounted to as much as £2,000,000 in one month, the relief should prove considerable. At the end of 1922 the lines upon which a solution of the reparations question, regarded as a purely financial problem, was to be sought were clearly laid down, but there was no agreement either between Germany's creditors or between them and Germany as to the procedure to be adopted to arrive at the desired end.

Inflation

The process of inflation has continued in Germany throughout 1922, towards the close of the year with terrifying rapidity. The note circulation on January 1, 1922, was Mk. 121,964,200,000; on September 1, Mk. 251,443,660,000; and on December 31, Mk. 1,293,065,231,000. On March 29, 1923, this total had risen to Mk. 5,517,919,651,000. Taking the amount of December 31—Mk. 1,293,065,231,000—(£38,031,330)—and comparing it with the gold cover on the same date—1,004,843,000 gold marks (£51,530,410)—it will be seen that the true value of the note circulation represented less than three-fourths that of the gold reserve, which is not at all an unfavourable position, and one which might well be used as a basis for a return to stabilisation. All Germany's serious and impartial critics are agreed that the first step towards betterment must come from within.

After the war, inexperienced and weak Governments found themselves forced to take over completely disorganised finances which had been shockingly mismanaged for years, and the task of reorganisation proved too heavy for them and the demands of the nation too strong. They could not risk dissatisfaction either on the part of the Right when the latter demanded compensation for war contracts, for war losses, etc., or on the part of the Left, who wanted cheap food and communications, unemployment doles and low rents. Sooner than face political troubles, particularly those connected with retrenchment and unemployment, the various Governments printed money in order to get over their internal difficulties. This statement is not made in a spirit of censure, as any Government which does not feel itself strong will naturally follow the line of least resistance; it is merely an attempt to arrive at the true state of affairs, because only thus can useful efforts be made towards improvement.

Capital Issues

As was only to be expected, in view of the continued intense depreciation, the total of capital issues reached a very high figure in paper marks during 1922, *viz.*, 80.6 milliards, as compared with 31.9 milliards in 1921 and 2½ milliards in pre-war years, the latter figure including various foreign loans which were issued on the German market. Expressed in sterling these amounts represent the following values respectively in the years in which they were issued: £9,485,701 in 1922, £78,468,994 in 1921, and £122,549,019 in pre-war years. At the beginning of the year industry made a pause after the many new issues which marked the close of 1921, and particularly in order to satisfy the expectations as to dividends on the more recent issues before proceeding to make further ones. Thus, the period from March to September was comparatively quiet. As an alternative, firms covered their requirements through bank credits, but by the end of the summer the money market had become so restricted that the necessary funds had to be sought elsewhere. Through the intensification of inflation which set in at the beginning of the autumn and a simultaneous increase in foreign purchases of German shares, a situation which was favourable to the issue of new shares was soon created, and by October the ball was set rolling by the aniline concern, which doubled its capital by the issue of 1½ milliard marks. From then onwards until the end of the year one new issue followed another, the only industrial group which did not participate being the mining industry, which has pursued the soundest policy of adjusting its prices rapidly to the rise in costs. Towards the end of the year the banks were extremely active, and in December alone issued 5½ milliard marks of shares. The total amount in new shares asked for by existing German share companies (Aktiengesellschaften) represented a nominal value of 46 milliard marks (previous year 19·2 milliard marks). The number of issuing companies was 2,292 (in 1921, 1,806).

Considering the need of capital which must undoubtedly have existed, it is somewhat remarkable that the average rate at which new shares were issued during 1922 was only 200 per cent. (1921, 136 per cent.). During the year 587 companies issued preference shares with multiple votes to the amount of 1,297 million marks, and 73 companies preference shares with single votes to the amount of 1,227 million marks. In 81 cases (459·7 million marks) it has not been possible to ascertain whether the preference shares carried one vote each or more.

The formation of new companies has continued with unabated energy during 1922. The total number is put at 2,208, with a total original capital amounting to 12·7 milliard marks.

Some General Conclusions

There can be no doubt that, after taking into consideration the various factors which have been outlined in the foregoing, extreme caution must be exercised in expressing any opinion as to Germany's real position at the end of 1922. Inflation dominated every phase of public and private life, and inflation means constant fluctuation and uncertainty. This condition expresses itself particularly in the public finances, and to use them as the basis upon which to arrive at any sort of conclusion would be a mistake. The result would be equally fallacious if some such standard as the value of German shares were taken, as the following brief calculation will show. On October 1, 1922, the nominal capital value of all German share companies (Aktiengesellschaften, G.m.b.H., and Kommanditgesellschaften auf Aktien) amounted to £8,691,558, and the market value on the same date was £152,326,371. On

December 1, 1922, the corresponding figures were £3,710,316 and £271,206,768. It will be seen, therefore, that not only would such a standard be unreliable because it shows very large variations, but also because it does not represent anything like the true worth of the properties and rights involved. An accurate assessment could, of course, be made on certain capital values in the country; forests, mines, factories, real estate, machinery, etc., could be, without much difficulty, expressed in terms of dollars or of pounds; but what naturally interests Germany's creditors most is the true revenue produced from such sources and from trade, and it is just this revenue which is almost completely disguised by inflation, and there seems no chance of any change until German currency is stabilised.

It would manifestly be impossible under present conditions to ascertain what the income in gold of the German nation is. Neither the Government nor private undertakings show their gold receipts in any published accounts or balance sheets, and, of course, it cannot be said at what rate they are converted into paper marks for the purpose of publication. Even more impossible is it to obtain any information as to the gold earnings which do not enter the country. These latter are, in any case, of no interest from the point of view of reparations, as no means could be devised to seize them, and naturally they would never be voluntarily disclosed. They are, however, of importance because, just as Germany's natural and industrial resources at home form an admirable basis for reconstruction, so these hidden foreign deposits might play a great part in Germany's future development when her nationals feel at liberty to use them freely. Any estimate as to their amount is naturally pure guess work. There are many reasons why a German should try to possess as large foreign balances as possible; they are the safest, the most stable and the most convenient form of wealth. If he is a manufacturer, they offer him the best security for the renewal of his raw material. Further, they are in any case immune from forced loans, capital levies, etc., for reparation purposes; they are immune from the regulation which provides that foreign earnings are to be handed in, in whole or in part, to the German Government in exchange for marks; and, finally, they are immune from any complete financial crash in Germany.

On the other hand, it must be remembered that it is only the exporter of German goods who has any facilities for acquiring foreign balances, the rest of the population being legally prohibited from doing so, although no doubt the law, which is economically an unsound one, is not difficult to evade. Further, depreciation has at times been so rapid and so great that even wealthy concerns found their paper mark assets insufficient to meet current requirements, and were compelled to realise their foreign holdings to a certain extent. The figure which is usually mentioned in German industrial circles as representing the total value of German cash and in securities abroad is £50,000,000. Probably this refers only to such amounts as might possibly be recognised as German property; to it should be added, however, those sums which stand in the names of non-German persons and holding companies, but in reality are owned by German individuals and firms. Even then a figure not much exceeding £200,000,000 is likely to be arrived at, an amount which in comparison with Germany's indebtedness must be called small.

The Ruhr Situation

The Ruhr contains by far the most important German coal and coke supply, and, in addition, there are situated in this area all the greatest German smelting and iron and steel producing works. The mines and works are, for the most part, run on modern principles, and therefore their output of by-products is also very large. Thus, they are the suppliers to German agriculture of sulphate of ammonia and of coal tar to the large chemical concerns. The whole of this area has now been surrounded by the occupying Powers, who have taken steps to prevent coal supplies from entering unoccupied Germany. The total population of the Ruhr district is about 5 million, of whom 550,000 are miners and 100,000 railwaymen. The railway directorate at Essen supplies daily an average of 20,000 trucks, of which 8,000 are for the use of local industry, and 12,000 are used for transport beyond the Ruhr area.

The German Government replied to the occupation by stopping all reparation deliveries to France and Belgium, and by forbidding all German officials to obey the instructions of the occupying Powers in any way. Further, the general public were advised that only the German laws and regulations were to be observed and German Government offices used for financial and administrative purposes. German firms have cancelled their contracts with French and Belgian houses; more particularly as far as the Ruhr is concerned, for the purchase of ore from Lorraine, and such agreements as that of Herr Stinnes with Senator Lubersac have also been terminated. Considerable public and private funds are being applied for the relief of the many officials and others who are being expelled both from the new and the old Occupied Territory, for the provision of food to the Ruhr area, and for the payment of the working population.

How long the present situation can last and what its results are likely to be it is quite impossible to foretell. Since the new occupation has been carried out the Germans have got through large quantities of coal and coke into unoccupied territory. The stocks in the country were at that time also fairly good; and as, further, Germany appears to be making preparation to increase her imports, chiefly from England and Czecho-Slovakia, it is probable that, even if she receives little or nothing from the Ruhr, she may be able to continue without serious embarrassment for some time to come. In any case only about 43 per cent. of the Ruhr production are normally absorbed by unoccupied Germany. Endeavours are being made to increase the production of coal and lignite in unoccupied Germany by working extra shifts, and it is said that, for patriotic motives, the miners are willing to agree.

Law against Flight of Capital

This law, which was originally passed on December 24, 1920, and altered on March 22, 1922, was subjected to further important changes which came into force in January, 1923. The chief of these are:—

In the first place, the so-called flight of capital which had up till then been only a matter of subsequent control is in future to be subject to anterior authorisation; thus banks may only carry out orders for the transfer of money, papers and other values abroad if the declaration of the person giving the order has been passed by the local Finance Office. This authorisation may be dispensed with in the case of persons who have obtained a certificate from their Chamber of Commerce that it is essential for their business to transmit money, etc., abroad.

Secondly, the question of when an exporter shall be permitted to leave the price which his goods realise abroad in the country where the sale is effected is strictly laid down and is made subject to very heavy penalties in the case of contravention. The law says that if such sums are left abroad with the object of withdrawing them from German economic life the exporter may be forbidden to continue the sale of his goods in foreign countries, even if they should not be subject to an export licence under the Foreign Trade Control Regulations.

A third alteration which has been introduced into the law is the increase of the amount of German money which may be personally taken out of the country in the course of any one month without special permission. This has been raised from Mk. 20,000 to Mk. 200,000. The law in its new form is to remain in force until December 31, 1924.

Foreign Trade

According to official computation, 60 per cent. of German exports are invoiced in foreign currency and 40 per cent. in paper marks. It is claimed by the German authorities that their method of conversion does not take into account those losses which German exporters have incurred on this 40 per cent. through such depreciation of the mark which took place between the date of the invoice and the date of payment; these losses are put at several hundred million gold marks. There is, however, one factor which may well modify this estimate of the German Statistical Office: it is the practice of the German exporter nearly always to put a saving clause (freibleibend) in his contract which enables him to alter the price so that it corresponds to the exchange on the day of delivery; this practice should usually protect him from serious loss. Possibly, however, the Statistical Office is not able to follow this increase in the paper mark price and has to rely only on the original invoice or on the amount given in the export licence. This means that several hundred million gold marks should be added to the export values.

Imports of Fuel

While Germany during the first ten months of 1913 imported 13,400,000 tons of coal fuel, she has during the same period of 1922 imported 10,914,000 tons. Her exports in 1913 (January to October) amounted to 38,390,000 tons and in 1922 (same period) to 6,115,000 tons. The Reparations deliveries for the ten months in the latter year, calculated on the same basis as that given above, amounted to 15,544,000 tons.

Germany's chief coal imports in 1922 were as follows for the ten months :—

From	Tons.
Coal.	
Great Britain	6,049,338
Polish Upper Silesia	1,871,029
Saar Area	931,400
Coal Briquettes.	
Great Britain	8,260
Polish Upper Silesia	5,828
Lignite.	
Czecho-Slovakia	1,878,647
Lignite Briquettes.	
Czecho-Slovakia	29,726
Coke.	
Great Britain	144,550
Polish Upper Silesia	58,449

With regard to iron ore, the turnover has decreased very much, but the net imports are almost the same as in January to October, 1913, *viz.*, 11,686,930 tons in 1913 and 9,276,002 in January–October, 1922. Other interesting exports which have decreased are potash salts and sulphate of potash and magnesium from 1,446,200 tons to 722,600 tons, Thomas phosphate meal and super-phosphate from 830,400 tons to 15,100 tons, and diverse chemical raw materials and semi-manufactures from 170,800 tons to 40,000 tons.

The most remarkable increase in exports is that of salt, of which 785,000 tons were exported in the first ten months of 1922, more than double the amount for the same period of 1913, *viz.*, 360,100 tons.

(*b*) Raw Materials and Semi-Manufactures.	Import. January to October.		Export. January to October.	
	1913. Tons.	1922. Tons.	1913. Tons.	1922. Tons.
Oil cake, oil cake flour	690,500	90,100	245,200	138,100
Timber	5,199,700	1,940,800	399,400	597,500
Pulp wood	1,070,800	593,100	55,700	2,400
Wood pulp, cellulose	45,800	61,600	156,800	64,000
Cement	140,400	122,500	941,300	350,200
Other stones and earths (except mineral phosphate)	2,554,100	779,100	2,535,000	2,969,600
Coal, coke, briquettes	13,400,000	10,914,000	38,390,000	6,115,000
Iron ore	11,686,900	9,276,000	2,177,600	117,900
Iron	384,000	774,300	877,400	199,800
Iron semi-manufactures	9,100	214,400	584,000	67,100
Potash salts and sulphate of potash and magnesium	—	200	1,446,200	722,600
Thomas phosphate meal and superphosphate	412,100	285,000	830,400	15,100
Other chemical raw materials and semi-manufactures	872,400	108,600	170,800	40,000

Most of the articles in this table are particularly important, and the changes in the positions which they occupy in Germany's foreign trade are correspondingly significant.

Various Manufactures.	Exports. January to October.	
	1913. Tons.	1922. Tons.
Colours and dyestuffs	220,000	122,800
Sulphate of potash and chloride of potassium	438,900	216,300
Other chemical and pharmaceutical products	602,400	414,500
Clay and china clay goods (except bricks)	160,700	120,600
Glass and glass ware	192,500	113,500

Anglo-German Trade

It is in itself highly desirable to give every encouragement to reciprocal Anglo-German trade, but as long as the dangers involved in control exist it is impossible to recommend the extension of existing or the formation of new business relations. For proof that German foreign trade control has failed in its avowed object of improving German economic conditions in general and exercising a beneficial effect on German currency in particular, it is only necessary to look at the state of Germany at the end of 1922. Even if other adverse factors had not existed it is inconceivable that control could have done anything but harm. Had it been absent, there can be no doubt that German foreign trade and German foreign commercial relations would now be in a much more favourable position in spite of other difficulties.

Another cause of many complaints, which has already been pointed out in previous years, is the tendency of the manufacturer to use the ascendancy which he has obtained during the war and is perpetuating in the Foreign Trade Control Offices, for the purpose of doing his own export and eliminating the merchant. As by temperament, training and experience he is usually quite unfitted for this type of work, difficulties naturally result. A return of the excellently organised German trading community to its proper place in the commercial life of the country is much to be desired.

Increasing Use of Lignite

The further considerable progress in the production of lignite and lignite briquettes shows that the tendency to use this fuel as much as possible as a substitute for coal continues. This increased consumption of lignite takes place chiefly in the districts where it is produced, as, owing to the cost of transport and its comparatively low price and calorific value, this fuel cannot be carried any great distance. Apart from mere firing, however, lignite is also being used increasingly for the distillation of oil. This process, which was already referred to in last year's report, is gaining in importance.

Chemical Industry Wages

The following table shows the movement of the average weekly wage in the chemical industry in each month from April to December, 1922, and also the increases in each case compared with the pre-war figure. The number of hours worked per week before the war amounted to 54 to 60, as against 48 at the present time. The increase in wages from November to December amounts to 77 per cent. throughout. In the wages given for married workers, allowances for wife and two children under 14 years of age are included.

Average Weekly Wages Tariff in Chemical Industry.

Month.	Skilled.		Trained.		Unskilled.		Index of Cost of Living, including Food Heating, Light, Rent, Clothing. (1913=1).
	Unmarried.	Married.	Unmarried.	Married.	Unmarried.	Married.	
Pre-war wages ..	M. 32.96		M. 26.81		M. 23.85		
1922.							
April	888	942	841	894	832	886	—
May	1,018	1,072	967	1,021	955	1,010	—
June	1,177	1,233	1,112	1,168	1,095	1,152	—
July	1,443	1,506	1,355	1,416	1,330	1,393	—
August	2,047	2,119	1,921	1,993	1,900	1,972	—
September	3,578	3,682	3,346	3,451	3,301	3,408	—
October	5,076	5,217	4,738	4,879	4,673	4,815	—
November	9,076	9,490	8,506	8,920	8,353	8,788	—
December	16,222	16,836	15,175	15,789	14,915	15,564	—
Compared with Pre-War Wage (1913–14=1.)							
April	27	29	31	33	35	37	34
May	31	33	36	38	40	42	38
June	36	37	41	44	46	48	41
July	44	46	51	53	56	58	54
August	62	64	72	74	80	83	78
September	109	112	125	129	138	143	133
October	154	158	177	182	196	202	221
November	275	288	317	333	350	368	446
December	492	511	566	589	625	653	685

Occupation of Oppau

The Oppau chemical works of the B.A.S.F. were occupied by French troops from Ludwigshafen on Wednesday. Primarily a dye works, the Haber process was later developed there and in 1921 the works were wrecked by the disastrous explosion of ammonium nitrate stores.

Trade Conditions in Norway

Progress towards Recovery

MR. C. L. PAUS, Commercial Secretary to the British Legation, Christiania, writes that the pressure of the general economic crisis has asserted itself in Norway with increasing force during the past year. A large number of important concerns and many banks were unable to withstand the cumulative effects of deflation with the resources at their disposal and were compelled, after writing off great sums on account of losses, to proceed to a reorganisation of their finances. In other cases liquidation could not be avoided. The State, the Bank of Norway, and the leading private banks have all played a prominent part in the work of reconstruction. A marked improvement in the volume of export trade and the activity of shipping was not accompanied by a corresponding increase in profits, as the prices obtainable for the goods exported failed in most cases to equal costs of production, and shipowners were hard put to it to cover expenses. The unfavourable trade balance was, however, reduced, and a greater number of workers were enabled to find employment.

Some improvement is also noticeable in certain industries which cater chiefly for the home market, but competition from abroad, particularly on the part of countries with depreciated currencies is, difficult to cope with, and prices leave little or no margin for profit. Although wages were lowered in the course of the year the cost of labour remains higher than in competing countries, and a further reduction is considered essential. Conditions in the fishing district are, on the whole better than in 1921, but are still depressed owing to the financial difficulties of Central Europe and uncertainty as to Norway's commercial relations with the wine producing countries.

The increase in industrial activity has naturally led to an increased consumption of raw materials and instruments of production. This has, however, in many cases been satisfied irom stocks already in the hands of manufacturers or merchants. Realisation of the stocks of manufactured commodities, which have so long depressed the market, has proceeded slowly, and often at a great loss. A considerable increase has, however, manifested itself in the demand for fresh supplies, and transactions in foreign currencies have been much facilitated by the comparative stability of the krone.

It will be seen from the above that progress has been made during 1922 and that many obstacles to economic recovery have been removed. Conditions in general are still, however, very difficult, and the state of the public finances throws its shadow over the whole situation. In commercial and industrial circles the opinion is freely expressed that disregard for economic principles has contributed to the present state of affairs.

It is difficult to form an opinion as to the prospects of trade in the present year. The absorption of stocks and increased industrial activity would appear to indicate an improvement in future demand, but a further reduction in the purchasing power of the general public is anticipated, and much depends on the development of events outside Norway. British exporters have done considerably more business than in 1921, and it is possible that the French occupation of the Ruhr district may result in a further increase in the demand for British goods.

Condition of Trade

The volume of new trade increased considerably during last year, approaching in some cases the pre-war standard, but remained on the whole well below the level of a normal year. A marked improvement in the activity of certain branches of industry led to increased consumption of raw materials and instruments of production, but the demand for fresh supplies was in some cases partially satisfied from existing stocks, and was also diminished by financial stringency, which compelled manufacturers to confine their purchases of machinery, tools, etc., within the narrowest possible limits, and, frequently, to call for cheaper classes of goods. A great advance is, however, noticeable in the quantities of coal imported, mainly from the United Kingdom, which were twice as large as in 1921.

The market for imported manufactures still laboured under the depressing influence of stocks imported some years ago, but, with the gradual absorption of existing supplies, which were usually realised at a loss, a good deal more business was done than in 1921, in spite of decreased purchasing power on the part of the general public. The direction of trade has mainly been determined, as in 1921, by the state of the international exchanges.

During the earlier part of the year, when prices from Germany were quoted in marks, German firms were easily able to underbid their competitors, and consequently secured a good deal of business, notwithstanding uncertain delivery and constant demands for additional payments. They now, however, made their quotations in kroner, or some other foreign currency, and their prices are stated to approximate to those of their competitors. The temptation to place orders in Germany is, therefore, greatly reduced, and buyers are inclined to turn to other sources of supply. At the present moment French exporters seem in many cases to be in a position to offer the most favourable terms owing to the fall in value of the franc. So far as trade with the United Kingdom is concerned, the high value of sterling still constitutes a serious disadvantage, but the comparative stability of the exchange has facilitated transactions, and, thanks to more competitive prices and the good reputation of British firms, business has improved very considerably.

Prospects for 1923 depend upon many different factors, but, if the present revival of Norway's export trade can be maintained and old stocks are at last consumed, an increased demand for imported goods would appear probable. A further reduction in purchasing power is, however, anticipated, and attention is called to the proposals for increased protection of Norwegian manufactures.

The Metal Markets

The market for iron and steel and non-ferrous metals has improved considerably, but, owing to industrial depression, is still well below the pre-war standard. Supplies of iron and steel have been derived principally from Germany and Luxemburg, but to some extent also from Belgium, Lorraine, Sweden and the United Kingdom. In the case of tinplates the whole of the trade appears now to be in British hands, as the Norwegian rolling mill has closed down and will probably go into liquidation.

The greater part of the trade in crude metals, such as lead, copper, tin and antimony, has again been secured by the United Kingdom. The German competition in copper and brass manufactures is stated to have gradually diminished until it has practically disappeared. German firms are still, however, in a position to offer aluminium sheets, rods, and wire at low prices and to make good delivery. At the present time, owing to the fall in the value of the franc, French exporters appear to be doing a good business in copper and brass sheets, but delivery from France is stated to be somewhat slow.

Tariff Policy

Norwegian industrial interests have long been pressing for increased Customs protection on the ground that the existing Customs Tariff, which granted to Norwegian manufacturers, when it was drawn up in 1905, a protection corresponding to about 10 per cent. of their cost of production (the duties payable being fixed, in most cases, on a weight basis, at certain rates in kroner or öre per kilogram) is no longer adequate to protect home industry, in view of the higher level of prices now ruling. Various measures have been proposed from time to time, with the object of affording temporary relief, pending the submission of recommendations by a commission appointed in 1915 to consider a general revision of the tariff, but, partly owing to opposition on the part of the Agrarian Party to any proposal for increased protection which did not equally benefit agricultural produce, no definite conclusion has yet been arrived at.

Some modifications in the tariff were, however, introduced in July, 1922, when, in exchange for an increase of about 150 per cent. in the duty on live cattle, meat and eggs, the Agrarian Party agreed to an increase in the weight duty on certain industrial products and to a transition to *ad valorem* duties in the case of others, of which the majority were articles of luxury. In proposing these modifications the Customs committee of the Storthing stated that they had been influenced solely by fiscal considerations. Experience has, however, shown that the new rates *ad valorem*, as applied to goods imported from countries with a depreciated currency, frequently represent a reduction on the old duties levied according to

weight. Other objections are also seen to an extension of the system, of which perhaps the most important is the difficulty of checking invoice values, and it is considered in industrial circles that a sliding scale of weight duties is greatly to be preferred.

Chemical Imports

The following figures relating to the import of chemicals, supplied by the courtesy of the Department of Overseas Trade, into Norway for the year 1921 should be of special interest to British chemical exporters as an indication of the quantities absorbed by Norwegian industry. The greatest competitor is, of course, Germany, although in some products other countries hold the field, for example, the Netherlands import the greater part of the glycerin. The total value of chemical imports for 1921 was 9,156,000 kr. (exclusive of sulphur and explosives). The following figures of particular products (in round numbers of kilograms) are indicative :—

Caustic Soda.	Kilos.
Total import	859,000
Great Britain	486,000
Germany	218,000
Belgium	92,000
U.S.A.	50,000
Sulphuric Acid.	**Kilos.**
Total import	250,000
Sweden	60,000
Germany	189,000
Other countries	200
Aniline and Alizarin Dyes.	**Kilos.**
Total import	113,000
Germany	103,000
Great Britain	2,400
Switzerland	1,700

Non-Poisonous Gas

To the Editor of The Chemical Age.

Sir,—The claim of Mr. C. B. Tully to have produced, in an experimental plant at Newark-upon-Trent, a gas suitable for domestic and commercial purposes which contains only a negligible quantity of carbon monoxide must be of obvious significance to all makers and users of gas.

The possibility of producing such a gas has, of course, been known to the gas industry for many years, but the hitherto unsolved problems have been to produce it in commercial quantities and at a price that would not impose incommensurate burdens upon the consumer. Mr. Tully's claim has greatly interested the research authorities of the gas industry, and it would perhaps have been more valuable had evidence of practical achievement been put forward rather than general communications to the lay press. But whether Mr. Tully has made out even a *prima facie* case for the solution of the outstanding problems in this well-known field of investigation must be duly decided by authoritative test. It is important that the validity of this and of all similar claims should be adjudicated upon by the proper body in order that risks of disappointment to users of gas may be avoided.—Yours, etc.,

Parliamentary Committee of the Gas Industry.

28, Grosvenor Gardens, London, S.W.
May 19.

Preservative Materials for the Chemical Industry

Steel, concrete, wood and brick are the principal building materials used in chemical works, and in no case, says Mr. Maximilian Toch, in a paper given before the American Chemical Society, can any of these materials be left unprotected from chemical influences, with the exception of the interior of wooden vats, which it is seldom necessary to treat. A great exception, however, is that wherever fermentation takes place the wood must be coated with an alcohol insoluble compound, which is waterproof at the same time. Concrete construction and concrete floors must always be coated or treated to prevent attrition, and decomposition, from oil and acids. Steel work, whether encased or not encased, in masonry must also be protected, and the mortar of brick work, where bricks are very porous, is also usually treated.

Chemical Production in Canada

Official Survey of Conditions

The Canadian Bureau of Statistics has issued a useful volume on the chemical and allied products of the Dominion for the years 1919 and 1920. A special survey of Canada's chemical industries was undertaken by the Bureau as a section of the industrial census with two principal objects : (1) to provide a directory of Canadian chemical industries and their products for the use of the trade ; and (2) to assemble data regarding raw materials used, products and by-products manufactured, imports and exports, etc., thus indicating not only the importance of the industry and the progress which it has made in Canada, but also possible new and profitable trade openings in industrial chemical lines. The *Directory of Chemical Industries* was issued in 1919, and the entire supply was exhausted within a few weeks. A second edition, revised and enlarged, was prepared and printed in 1921. The present report is the result of the first comprehensive survey of the production of chemicals and allied products in Canada, referred to above as the second phase of the Bureau's work on this important group of industries. Under the classification plan used in the Bureau, industries are grouped by classes according to the principal component materials of their products ; on this principle, the present study was carried out in ten main groups. Summary statistical tables have also been prepared and are included in the introductory review. The report was prepared under the direction of Mr. S. J. Cook, chief of the Mining, Metallurgical and Chemical Branch of the Bureau, by Mr. H. C. Barlow. We give below the introduction and summary which appears in the volume :—

"The production of chemicals and allied products in Canada in 1919 and 1920 was studied under ten groups, namely : Coal tar and its products ; acids, alkalies, salts and compressed gases ; explosives, ammunition, fireworks and matches ; fertilizers ; medicinal and pharmaceutical preparations ; pigments, paints and varnishes ; soaps, perfumery, cosmetics and other toilet preparations ; inks, dyes and colour compounds ; wood distillates and extracts ; miscellaneous chemical industries. The industries coming under these items in 1920 comprised 456 establishments, employing more than 17,000 hands. A total of nearly $120,000,000 was employed as capital, and products aggregating nearly $122,000,000 in value were made. Pigments, paints and varnishes were easily the leading group. Soaps, perfumery, cosmetics and other toilet preparations came second, with acids, alkalies, salts and compressed gases a close third. Medicinal and pharmaceutical preparations ; explosives, ammunition, fireworks and matches ; wood distillates and extracts ; fertilizers ; inks, dyes and colour compounds ; and coal tar and its distillation products followed in the order named.

"Closely following production, the trend in imports and exports of chemicals and allied products showed a gradual but steady increase in value, particularly during the past twenty years. The earliest figures presently available are those for 1895, when a total of $3,469,200 worth was imported, made up of $1,174,408 from the United Kingdom, $1,614,921 from the United States and $679,871 from all other countries. The first figures now available for exports of chemicals and allied products date back to 1892, when a total of $760,800 was reached. Of this nearly $600,000 worth went to the United Kingdom and about $100,000 worth to the United States.

"Tables have been prepared showing the values of these imports by countries of origin and of the exports by countries of destination from the first year for which data are available down to date.

"The continuous advance which represented normal conditions before the war was much accentuated in the last four war years, and it is encouraging to note that during the past two fiscal years the export trade has been maintained at a level very considerably above what the normal pre-war rate of increase would have produced.

"Summary statistics have been prepared in tabular form, and the table forming the frontispiece to this report (published below) shows the principal data regarding this group of industries for each of the past three years.

"The other general tables are in two main groups : one for 1919 and the other for 1920. The nine tables in each group permit of a broad general survey being made both of the

industrial groups in the series and of the provincial distribution for each section covered, such as capital, labour, wages, cost of materials, value of products, etc., etc.

"Following the general tables there are ten chapters each treating in detail a separate group, and presenting in easily accessible form the statistical data regarding every phase of the industry required by the student of economics and statistics and by the business man seeking new avenues of development in his own or related lines of endeavour. The aim throughout has been to compile the available information in a way that might be easily read. For this reason, little mention has been made in the text of such data as may more readily be found in the tables.

"Changing conditions following the war were reflected in the chemical industries of the country much as in other industrial activities throughout the Dominion. The most noticeable falling off of the industries with which industrial chemistry had to do was, of course, in munitions. With the armistice the need for their products collapsed, the various plants were closed, and in many cases were immediately dismantled and sold. Raw materials stocked by these concerns were thrown on the market, and for a time the glut thus produced caused established and permanent industries much concern. That period, though trying, has come to an end, and market conditions are becoming more settled and trustworthy.

"The firms continuing to manufacture explosives are in several instances expanding their interests, and are going into manufacture of fine chemicals on a modest scale. Medicinals are still being produced, but the prospects are somewhat uncertain in this field. The paint and varnish industry is advancing by leaps and bounds, and shows every prospect of becoming one of the most successful of Canadian developments. Canada still imports considerable quantities of soap, but the Canadian manufacturers are able to take care of an ever-increasing share of the domestic market and at the same time meet competition in certain lines in the exports field. In wood distillation there is much room for advance, and laboratories will have plenty to do for some time, but the application of scientific control of processes and plants is having its effect.

"Data regarding production, imports and exports of all commodities are regularly compiled for Canada by the Dominion Bureau of Statistics at Ottawa. Production statistics are issued annually—in some cases monthly; imports and exports, as compiled from customs data, are printed monthly. Of interest particularly to chemists is the establishment within the past year of the Mining, Metallurgical and Chemical branch of the bureau, whose particular task is to collect and compile data relating to the chemical and mining industries of Canada, and to publish reports thereon. These data will be found of value as a barometer showing the rise or fall of production, and possibly as a guide to profitable new developments.

"Progress in the manufacture of chemicals and allied products in recent years has been rapid, and the results attained have more than justified the ventures made. The professional chemist and the chemical manufacturers have combined to advance the common weal, and a feeling of optimism dominates and leads the industry. Opportunities for the development of Canadian chemical industries are being sought out by careful research, and while Canada may not lead the world, there still are some of the chemical industries in which her influence will be strongly felt."

TABLE 1.—IMPORTS INTO CANADA, CHEMICALS AND ALLIED PRODUCTS, DURING THE FISCAL YEARS ENDING MARCH 31, 1895-1922.

Fiscal Years	United Kingdom	United States	Other Countries	Total Imports
	$	$	$	$
1895	1,174,408	1,614,921	679,871	3,469,200
1900	1,743,473	2,674,519	1,007,355	5,425,347
1905	1,988,784	4,106,188	1,467,730	7,562,702
1910	3,236,106	6,141,469	1,394,134	10,771,709
1913	4,411,455	10,220,001	3,011,005	17,642,461
1914	4,293,412	9,583,462	3,227,519	17,104,393
1915	3,061,189	9,907,278	1,418,379	14,386,846
1916	2,957,776	15,192,511	1,108,039	19,258,326
1917	4,183,090	23,151,423	1,338,485	28,672,998
1918	3,316,961	23,262,817	1,260,798	27,840,576
1919	3,397,095	28,719,765	2,165,787	34,282,647
1920	4,154,345	23,854,300	1,877,457	29,886,102
1921	6,048,717	26,766,364	3,509,531	36,334,612
1922	3,238,465	17,688,482	3 114,938	24,041,885

TABLE 2.—EXPORTS OF CANADIAN PRODUCTS, CHEMICALS AND ALLIED PRODUCTS, DURING THE FISCAL YEARS ENDING MARCH 31, 1892-1922.

Fiscal Years	United Kingdom	United States	Other Countries	Total Exports
	$	$	$	$
1895	204,089	199,876	58,306	462,271
1900	232,025	114,388	110,517	456,930
1905	292,171	777,721	332,725	1,402,617
1910	527,404	1,483,934	656,169	2,667,507
1913	613,595	2,270,631	934,196	3,818,422
1914	496,469	3,169,015	968,057	4,633,541
1915	649,334	3,749,631	893,016	5,291,981
1916	7,640,515	6,757,005	1,550,960	15,948,480
1917	32,593,751	15,137,772	4,861,412	52,592,935
1918	27,856,626	17,576,572	3,697,886	49,131,084
1919	20,176,855	30,671,606	5,951,338	56,799,799
1920	3,595,936	13,803,067	5,182,046	22,581,049
1921	3,225,947	11,694,858	4,661,246	19,582,051
1922	939,529	5,937,114	2,394,384	9,271,027

Trade Concessions in Russia

New Legislation

THE Board of Trade has received from H.M. Representative at Moscow translations of certain Decrees of the All Russian Central Executive Committee and the Council of People's Commissaries concerning the taking up of concessions in Russia, short particulars of which are as under :—

(*a*) Decree, dated March 8, 1923, provides for the establishment and appointment of a Chief Concessions Committee to control the participation of foreign capital in economic activities in Russia, and to conduct negotiations as to concession agreements of all kinds, including concessions to foreign companies and associations.

(*b*) Decree, dated March 29, 1923, provides for the establishment and appointment of a Special Concessions Committee to be attached to the Russian Trade Delegation in London. British and French firms (excepting British Colonial firms) desirous of obtaining concessions in Russia or of entering into any operations in Russian Territory must conduct their negotiations through the Special Concessions Committee.

(*c*) Decree, dated April 12, 1923, provides for the grant of concessions for communal undertakings (tramways, waterworks, etc.), in so far as the conditions of the concession agreements do not provide for any departure from the general laws, special conditions being provided in respect of the grant of such concessions to foreign citizens or firms.

(*d*) A translation of a further Decree, dated April 12, 1923, concerning foreign firms and their agencies in Russia, is as under :—

"1. Foreign firms are allowed to carry out trading operations in the territory of the R.S.F.S.R., and to open offices, branches, agencies, etc., only in the manner laid down by the Decree regarding the Chief Concessions Committee on the recommendation of the People's Commissariat for Foreign Affairs.

NOTE.—All representations of foreign firms existing at the date of the publication of this Decree in the territory of the R.S.F.S.R. must receive the permission provided for in the present clause within one month, on the expiry of which all agencies for which permission has not been granted are immediately liquidated.

Bankruptcy of a Chemical Company

IN the compulsory liquidation of The Russell Oil and Chemical Co., Ltd., York Works, Short Road, Stratford, E., and 35, Adams Street, Birmingham, which occurred on February 21 of last year, the Official Receiver has just issued to the creditors and to the shareholders a summary of the statement of affairs which shows liabilities £16,611 of which £11,968 are returned as expected to rank, and estimated assets £8,167 of which £939, are required to meet the claims of preferential creditors and £3,704 those of debenture holders. A deficiency of £8,444 is accordingly disclosed with regard to the creditors, while in relation to the shareholders a total deficiency of £8,895 is shown 451 £1 shares having been issued. In the opinion of the Official Receiver insufficient working capital contributed to the failure and the liquidation remains in his hands.

The Development of Empire Trade

The Work of the Imperial Institute

In its present form the Imperial Institute can hardly be regarded as anything more than a pale ghost of the great centre of Empire conceived by its originators. It was planned, according to an article appearing recently in *The Times Trade Supplement*, on most ambitious lines in days when this country had not made up its mind whether Greater Britain was an asset or a liability. It possibly owed its failure to fill the *rôle* designed for it partly to being born ahead of its time—a fate which has befallen many of the world's greatest men and their ideas. There were other causes, prominent among them being the long, costly and unsuccessful efforts to make the Institute a social centre, in competition with an already established organisation. Into these it is useless to go to-day. The past cannot be undone and the only course of practical interest is to take things as they are, attempt to assess the value of the present activities of the Institute and indicate if possible the directions in which they might be usefully extended or curtailed. Some of the functions which were performed at one time by the Imperial Institute are now carried on by other bodies or by departments and representatives of various Empire Governments, and there is little prospect of any successful attempt being made to replace the present arrangements by a more centralised and comprehensive system. Such co-ordination as is desirable in these directions can be better effected in other ways.

Present Constitution

The present constitution of the Imperial Institute dates from April 1916, when an Act was passed transferring the property and management to the Secretary of State for the Colonies, with provision for an executive council of twenty-five members nominated by the Board of Trade, the Secretary of State for India (two each), the Ministry of Agriculture and Fisheries, the Government of India, the Governments of the Dominions (one each), and the Secretary of State for the Colonies (fourteen). The principal work of the Institute, which has been carried on since 1903 on these lines by its director, Dr. Wyndham R. Dunstan, F.R.S., is now concerned with the development of the commercial and industrial use of the raw materials of the Empire. This task is divided into three departments—Investigation, Intelligence, and Exhibition—which are provided with expert staffs with specialised scientific and technical qualifications. An important feature of the organisation is the system of advisory committees, of which there is one for India and each of the Dominions (in the case of the latter presided over by the respective High Commissioners), and five Technical committees (Raw Materials, Mineral Resources, Ceylon Rubber Research, Silk and Timbers). There is also a Finance and General Purposes Committee. The Raw Materials Committee, of which Sir Algernon Firth is Chairman, includes representatives of the London, Liverpool, Manchester, Glasgow, Bristol, Norwich, Hull, and Middlesbrough Chambers of Commerce, the Association of British Chambers of Commerce, and the Federation of British Industries.

In the case of minerals, a newer organisation known as the Imperial Mineral Resources Bureau was established in 1919, and there has since been some overlapping in this field between the Institute and the Bureau. This matter will be dealt with in a later article.

The Investigation Department

It is proposed to survey briefly the work already accomplished by the Investigation Department. A number of societies have their offices in the Institute building, and in some cases work in close co-operation with it. These are the International Association for Tropical Agriculture (British Section), the Empire Forestry Association (which works in conjunction with the Advisory Committee on Timbers), the Overseas Nursing Association, the African Society, and the Northbrook Society. The work of the two former will be discussed in a subsequent article. They occupy accommodation which could hardly be usefully employed by the Institute, consisting of a number of small rooms, and there is an obvious practical advantage in collecting as many as possible of such societies in one centre. Yet this statement must not be taken to imply that the Institute is overburdened with space, and the official proposal to house the War Museum in the building should be strenuously resisted.

Inspection of the laboratories and testing rooms of the Investigation Department must convince an open-minded inquirer that there is at least one side of the Institute's work which is not only extremely valuable, but might profitably be considerably expanded. The laboratories receive samples of new or little-known raw materials from the Governments of various parts of the Empire and from British representatives in foreign countries, and they also undertake special work for firms or private individuals in any part of the Empire on payment of the cost of the investigation. Mineral surveys have also been conducted in Ceylon, Nigeria, and Nyasaland.

New Paper Making Materials

In the showcases of the reference sample room are to be seen the results of many interesting and valuable investigations. Among these the writer was particularly impressed with the section relating to paper made from various materials not yet commercially used for this purpose. The bamboos which cover vast areas of British East Africa have been proved to be capable of being utilised for the manufacture of wood pulp for paper-making, and as there are local supplies—at Lake Magadi—of the soda required in the digesting process, there are good prospects of a pulp industry being established. Tenders for leases of bamboo lands are now being invited by the local Government. Papers of good quality have been made by manufacturers in this country from bamboo. Other African paper-making materials which have been shown to be quite satisfactory are tambookie grass and the spent wattle bark from which the tanning ingredient has been extracted. As the result of investigations by the Institute during the war, the extraction of wattle bark extract, formerly a German monopoly, is now being undertaken in South Africa, and the manufacture of paper and cardboard from the spent bark will follow. In view of the fact that before many years are past there is every probability of a severe famine in paper-making materials of the types now utilised, this work on possible substitutes will eventually prove to be of the greatest value.

Very useful work has also been done in connection with oil seeds, and as the result of the investigations conducted at the Institute Indian opium is now taking the place of the product of Persia and Turkey. During the four years 1916–19 nearly £400,000 worth of Indian opium was imported by this country for manufacturing purposes, whereas previously none was so employed. The utilisation of the Indian ajowan plant for the manufacture of thymol, formerly made almost exclusively in Germany, and the extraction of atropine from the wild Egyptian henbane, which has now become an article of export, are other interesting results achieved.

Improvement of the winding of Kashmir and Mysore silks leading to a great advance in the quality of fabric that can be made from them and the demonstration of the suitability of the extraordinary communal nests of the African anaphe moth as a source of raw silk are other achievements standing to the credit of the Investigation Department.

Mineral Discoveries

Some of the noteworthy accomplishments were the discovery of thorium-producing deposits in Ceylon, the location of the great Udi coalfield in Nigeria, which will eventually render our West African territories independent of imported coal, and the replacement, during the war, of Turkish boxwood by the boxwood of South Africa. On the initiative of the Timbers Committee, tests were carried out, in conjunction with the Office of Works, which have led to the inclusion in the official timber specifications of that department of various British Columbian and Eastern Canadian timbers as alternatives to European woods. Much attention has also been devoted to cotton and jute.

These examples must suffice as an indication of what the laboratories of the Institute have already done. At present they are working on various problems connected with rubber in addition to pursuing the investigations of oil seeds and testing cement. So far the Institute has dealt with materials sent to it, and has been able to cope with the volume of work without undue delay, but has been quite unable itself to initiate the search for new materials and the discovery of fresh sources of already utilised raw materials in little-known parts of the Empire.

Chemical Industry in Canada

Development in the Western Provinces

THE Prairie Provinces of Canada are classed as agricultural areas, and up to the present time they have not been considered seriously as probable contributors to the mineral wealth of the country. Recently, however, the resources of these provinces in non-metallic minerals, such as clays, coals, oil, gas, and the sodium and magnesium salts, which occur in the numerous alkali lakes and sloughs throughout the area, have been attracting the attention of capital, with the result that considerable activity is evidenced in all these lines.

The increased interest in the alkali deposits of Western Canada has induced the Mines Branch of the Canadian Department of Mines, Ottawa, to institute a detailed investigation of these deposits with a view of determining their possible economic value and the extent of reserves. The work has now been in progress under the direction of Mr. L. H. Cole during the last two field seasons.

Natural occurrences of soluble mineral salts are known in the provinces of Manitoba, Saskatchewan, Alberta, and British Columbia, either in the form of bedded deposits or as brines. Some are of considerable extent, and are probably of sufficient size to warrant commercial exploitation, provided economical methods of recovery can be developed and sufficient markets can be established.

Three of these deposits are being operated, or will shortly be operated, in the Prairie Provinces, and plans are under way for the development and operation of a fourth deposit.

At Dana, Saskatchewan, a half million dollar plant is nearing completion, to extract salt cake and other chemical products from the brines of Muskiki lake, formerly Houghton lake 23 miles west of Humboldt, Sask. The company operating this deposit is The Salts and Chemicals, Ltd., controlled by Canadian and United States interests. The main plant of this company is at the deposit at the lake, and they have a refining plant at Kitchener, Ontario. When this plant is in operation, it is estimated that the output will be 30,000 tons of salt cake per year besides Epsom and other salts recovered as by-products. A small village has been erected at the lake with housing accommodation for 60 men. When the plant is working at fuller capacity 100 men are to be employed.

Sodium Sulphate Plant

At Frederick lake, five miles south-west of Dunkirk, Sask., and 38 miles from Moose Jaw, Sask., another salt cake recovery plant has been erected by The Bishopric and Lent Co., with head offices at Cincinnati, Ohio. This plant is practically completed with a capacity of fifty tons of salt cake per day, and as soon as it proves commercially successful, further units are to be added to increase the output to 200 per day. At the present time twenty men are employed at this plant.

At a lake five miles north of Fusilier, Saskatchewan, an experimental plant has been operated by a company called Soda Deposits, Ltd., with head office at Calgary, Alberta. This deposit, although somewhat smaller than some of the other deposits, contains sodium sulphate in a very pure state and several shipments have already been made. This company hopes in the near future to be in a position to put its product regularly on the market.

In British Columbia, the Basque Chemical Co. is operating a series of five lakes situated fifteen miles west of Ashcroft, B.C. From these lakes they are excavating crude magnesium sulphate (Epsom salts) which is shipped to Vancouver, where it is refined and sold as medicinal salts, and to the tanning industry. Plans are now under way for greatly extending the development of this deposit.

In the vicinity of Meadow lake, fifty miles north of Clinton, B.C., the Lillooet Soda Co. is operating a sodium carbonate lake and shipping their product to Vancouver over the Pacific Great Eastern Railway. This material is being disposed of at the present time to the soap manufacturers of the Pacific coast, but plans are under way to dry the material at the lake and increase the output.

The several main products which may be expected to be produced from these deposits are Glauber's salt, salt cake, Epsom salt, soda ash and baking soda. The operations of these companies tend to bring before the public the possibilities of the western provinces in the mineral field, and should form the nucleus of the ever increasing industry which in time should prove of great importance to the whole of Canada.

Two Reports on Shipping Conditions

The Chamber of Shipping

THE annual report and the proceedings of its annual meeting has been issued in book form by the Chamber of Shipping, and, as a result, a very comprehensive and valuable work of reference has been produced. Its pages contain an excellent survey of the activities of the struggling shipping industry besides much valuable statistical matter.

The sections of the report dealing with the adverse circumstances against which the shipowners are struggling in their efforts to re-establish this country's maritime supremacy are particularly interesting, while the portions appertaining to freights reveal the fact that a reasonable profit on capital invested is still unobtainable.

The report also shows that operating costs are diminished but little, despite the fact that officers and men have accepted lower wages, for the simple reason that other labour costs, dock charges, prices of stores and fuel, etc., are still extremely heavy.

At the annual meeting there were many troubles which attracted the attention of the shipping powers, and, since the report was first issued, these troubles have not become much the less acute. However, the lessons which have been learned during the most severe depression the industry has ever known will stand shipowners in good stead when the actual revival in shipping does come.

The Chamber of Shipping is to be congratulated upon issuing its report in book form, for it should be of great service from time to time when the discussion of shipping matters is necessary.

The Imperial Shipping Committee

The report of the Imperial Shipping Committee, which has just been issued, comes at an opportune moment in view of the forthcoming Imperial Economic Conference. This Committee, it may be remembered, was appointed by Mr. Lloyd George, in June, 1920, for the purpose of inquiring into complaints in regard to inter-Imperial shipping and of making a general survey of the material facilities for inter-Imperial commerce.

Consisting of representatives of the Imperial, Dominion and Indian Governments of the Colonies and Protectorates, and of shipping and commerce, the Committee, under the chairmanship of Sir H. J. Mackinder, has held upwards of fifty meetings, apart from several sub-committees and conferences between shipowners, shippers and other interested parties to discuss particular problems.

It is, therefore, not surprising to find that the work done embraces many aspects of Imperial shipping, and affords an adequate view of the general situation. In all, five reports have been presented by the Committee, and by far the most important of these deals with complaints as to ocean freights and facilities—notably the deferred rebate system.

It is not our purpose to deal at length with each class of complaint or to indicate the main developments which have taken place as a result of the exhaustive work accomplished by the Committee, but the decision arrived at over the deferred rebate system is worthy of attention.

Proposed Shippers' Association

The Committee emphasised the necessity for the formation in every ocean trade of a thoroughly representative association of shippers, which could discuss questions relating to that particular trade authoritatively with the shipowners not already organised in their conferences. This, all will be agreed, is the only course which will lead to friendly co-operation and elimination of every possibility of a rate war, and it is pleasing to learn that steps have been taken to establish such an association, the formation of which is now assured.

Upon the question of freights, the Committee has also arrived at certain definite and satisfactory conclusions, particularly as to the general level of freights in the New Zealand homeward trade.

The report also gives a brief but informative general survey of maritime facilities and a statement on the question of shipping subsidies, and concludes with a strong recommendation for the constitution of a permanent Committee on Shipping, a recommendation with which all interested in this most important of industries will readily concur.

European Trade and Industry Fairs

WHATEVER may be said of some branches of industry, it is evident that the Exhibition business has not only recovered its pre-war standard but reached a measure of activity that surpasses all previous records. Europe is at all events doing enough business to justify a number of Fairs and Exhibitions which go beyond anything ever attempted in the days before the war. The following list, which we take from the current issue of *The European Commercial*, should be of interest to those who realise that the reconstruction of Europe is a matter for business men :—

IN PROGRESS.

Until		
May 21	Geneva Exhibition	Geneva.
„ 25	6th International Fair	Valencia.
„ 25	Annual Fair	Paris.
June 4	Commercial Fair	Madrid.
„ 21	Agricultural Fair	Prague.
„ 22	14th Internat. Sample Fair	Budapest.
„ 30	Photographic, Optical, Cinematographic	Turin.
Sept. 30	Jubilee Exhibition	Gothenburg.
Oct. 31	Applied Arts	Monza.
In May	Arts and Handicrafts	Troyes.
„	International Fair	Lisbon.
„	Agricultural Fair	Stuttgart.
„	Agricultural Machinery	Konigsberg.
May–June	Furnishing and Decorating	Barcelona.
May–October	Decorative Arts	Monza.
„	International Fair	Le Mans.
„	Hygienic Exhibition	Strassbourg.

FORTHCOMING :

June 1–14	International Mining	London.
„ 1–15	General Fair	Brest.
„ 1–15	Sample Fair	Padua.
„ 1–Oct. 31	Electro-Mechanical Appliances	Ghent.
„ 2–11	Industrial and Agricult. Fair	Reval.
„ 7–12	Agricultural Fair	Hamburg.
„ 15–30	Sample Fair	Bordeaux.
„ 18–22	25th Chemists' Exhibition	London.
In June	Sanitary Exhibition	Madrid.
June–July	Sample Fair	Riga.
July 1–6	International Sample Fair	Helsingfors.
„ 9–20	London Fair and Market	London.
„ 15–31	Sample Fair	San Sevastian.
„ 15–Sept. 10.	International Fair	Nijni-Novgorod.
„ 20–Aug. 12 .	Aeronautic Exhibition	Gothenburg.
„ 22–Aug. 5 ..	Industry and Agriculture	Riga.
Aug. 4–12	General Fair	Fredericia.
„ 11–19	International Sample Fair	Reichenberg (Liberec).
„ 12–17	Eastern Fair	Konigsberg.
„ 20–26	Swedish Trade Fair	Gothenberg.
„ 23–Sept. 10	3rd Oriental Fair	Bratislava.
„ 26–Sept. 1 ..	International Technical Fair	Leipsic.
In August	General Fair	Luxemburg.
„	National Fair	Malmo.
Aug.–Sept.	Agricultural Fair	Moscow.
„	Maritime and Commercial Fair	Antwerp.
„	Franco-Spanish Fair	Bayonne.
Sept. 1–10	Ljubljana Trade Fair	Ljubljana.
„ 2–5	International Sample Fair	Breslau.
„ 2–8	5th International Sample Fair	Vienna.
„ 2–9	Norwegian Sample Fair	Christiania.
„ 2–9	International Sample Fair	Prague.
„ 3–24	International Sample Fair	Trieste.
„ 5–13	Horticultural and Floricultural	Geneva.
„ 5–17	International Sample Fair	Lemberg.
„ 8–14	27th International Bakers and Confectioners' Exhibition	London.
„ 8–23	4th Swiss Agricultural and Food	Lausanne.
„ 9–15	International Sample Fair	Cologne.
„ 9–16	Fishing Exhibition	Boulogne.
„ 10–25	International Sample Fair	San Sebastian.
„ 11–14	Hotel Industry Exhibition	Hamburg.
„ 14–23	Scandinavian Horticulture	Gothenburg.
„ 15–30	International Sample Fair	Naples.
„ 15–Nov. 1 ..	International Sample Fair	Baku.
„ 16–30	International Timber Exhibition	Lyons.
„ 17–22	26th Chemists' Exhibition	Glasgow.
„ 22–28	27th International Grocers, etc.	London.
„ 23–29	International Sample Fair	Frankfort.
In September	9th International Sample Fair	Utrecht.
„	Norwegian Sample Fair	Christiania.
„	International Sample Fair	Trieste.
Oct. 1–5	International Sample Fair	Lyons.
„ 1–5	13th Medical Exhibition	London.
„ 4–14	Automobiles, Non-Commercial	Paris.
„ 8–12	Shoe and Leather Fair	London.
„ 10–20	Textile, Machinery, Yarns and Fabrics Exhibition	Leicester.
„ 13–Nov. 11	International Gas Exhibition	Amsterdam.
„ 15–Dec. 15	Technical Construction	Barcelona.
In October	General Fair	Munich.
„	Brewing and Allied Industries	London.
In December	Leather Exhibition	Chalon-s-S.

German Trade and Industry in April

THE Commercial Secretary at Berlin (Mr. H. N. Sturrock) has forwarded to the Department of Overseas Trade a report, based on the reports of the Prussian Chambers of Commerce, on German trade and industry during April, in which it is stated that there was no change of any importance in the economic situation during April. Business continued quiet in the first half of the month. On April 18, however, in consequence of the renewed fall of the mark by about 50 per cent., a small revival of trade took place. On this day the Reichsbank were unable any longer to hold the mark, which had remained stable since the end of January as a result of the measures which they had adopted ; they gave way to the pressure which was in great part due to pure speculation, protected their own holdings of foreign values, and substituted for their former firm measures an elastic system which aims at new ways of meeting an unlimited rise in foreign values. In the interests of the standard of life of the people, it is imperative that such a rise be prevented.

In the retail trade, the public's disinclination to buy began gradually to disappear ; there was even a lively demand from April 18 to 20, which, however, again weakened towards the end of the month.

In Occupied Territory, the consequences of the separation from the rest of Germany became more evident. The French succeeded in increasing somewhat the despatch of coal and coke. The quantities transported did not, however, amount to one-sixth of the deliveries under the Reparations programme.

Small Demand for Potash

In the potash industry the unfavourable development of the market conditions continued throughout April. The calls by German agriculture were, contrary to expectation, small, so that that portion, in particular, of the potash works which has no factories at its disposal—particularly, therefore, the pure potash raw salt works—was compelled to drop shifts. There was also no improvement of any importance in the foreign sales of potash products. The necessary reduction of potash prices in view of the reduced coal prices could not yet be made, but will take place when the freights for fertilisers and for brown coal fuel have been lowered.

Chemical Industry

The falling off in the demand for chemical preparations and ceramic chemicals which became noticeable immediately after the unexpected rise of the mark, gave place at the beginning of the month under review, at any rate at home, to a revival, which, however, did not last long. As soon as the dollar began to advance the inclination to buy diminished at once, and since then the reserve of the inland market continued and was much felt. Foreign trade ceased almost completely in the first half of the month under the pressure of the stabilisation of the mark. It will, in fact, be difficult in the altered condition of currency, to retain the foreign market even to anything like the former extent, as, according to the unanimous assurance of agents and customers, for a large number of manufactures the world's market price has, in part, been reached, and, in part, exceeded. In particular, German prices for chemicals are higher than those of America, especially as that country, unlike Germany, enjoys very favourable Customs treatment not only by Entente countries, but also by Czecho-Slovakia and Poland. It is, therefore, urgently desired that the export duty for laboratory chemicals and ceramic chemicals be soon still further reduced in view of the enormous foreign competition.

From Week to Week

THE DORR COMPANY of New York transferred their offices to the Park-Lexington Building, 247, Park Avenue, New York, on May 12.

A SMALL FIRE occurred at Riley and Co.'s chemical and colour works, Oakenshaw, Clayton-le-Moors, Lancashire, on Tuesday, May 15.

PROFESSOR SIR WILLIAM BAYLISS, F.R.S., will deliver the first of a series of lectures at the Royal Institution, London, on "The Nature of Enzyme Action," on Thursday, May 31, at 3 o'clock.

JAMES C. BARR, LTD., chemical merchants, etc., have removed to larger and more central offices at 67, Great Clyde Street, Glasgow. The new telephone numbers are 2965 and 2966 Central.

DR. H. A. LORENTZ, of the Leyden University, visited Manchester on Friday, May 18, and delivered a lecture at the University on "Primary and Secondary Radiation." Professor Bragg presiding.

IT IS OFFICIALLY STATED that the discovery in Johore, British Malaya, of a lode containing scorodite, a somewhat rare ferric-arsenate, has been reported,and that the matter is being investigated by the geologist.

SWITZERLAND WAS the greatest importer of dyestuffs into the United States for the month of April, having supplied 42 per cent. of the total; Germany being second with 37 per cent. This is the first time Switzerland has headed the list. The British dyes imported were 1 per cent. of the total.

AFTER A STRIKE lasting a little over a week 150 fine chemical workers employed by Messrs. Harker, Stagg and Morgan, London, resumed work on Saturday, May 19, as a result of negotiations. The workers agreed to resume work on the conditions that existed prior to the dispute, with one or two minor alterations.

MR. DAVID BROWNLIE, of 46, Grange Road, Ealing, London, W.5 (Telephone number "Ealing 2344"), has, by arrangement ceased his connection with Brownlie and Green, Ltd., of Manchester and London, and is now engaged in private advisory practice in matters relating to fuel economy, coal carbonization, etc.

IN HOECHST this week the French delegate of the Rhineland Commission demanded that work should be recommenced in the dye factory, and when the workmen's council refused to order this, caused a referendum to be taken. The six thousand workers unanimously voted against the resumption of work so long as the premises were occupied by troops.

THE ASSESSMENT APPEAL of Brunner, Mond and Co. against the Manchester Ship Canal Co. has been finally dismissed in the House of Lords by Lords Buckmaster, Shaw, Sumner and Carson. The appeal related to the question of maintaining efficient access to the Western Mersey Lock and the navigable channel of the Mersey, and the proceedings have been very protracted.

THE ANNUAL GOLF medal competition (under handicap) for the challenge cup given by the late Sir John Brunner in 1909 for competition in the chemical trade of the United Kingdom was decided over the links of the new Sandiway Golf Club, Northwich, on Thursday, May 17. The contest was a keen one, a point only separating the cup winner, Mr. A. H. Cowap, from the runner-up, Mr. H. W. Jones (Winnington).

THE FIRST of the two conversaziones given annually by the Royal Society was held at its rooms in Burlington House on Wednesday, May 16. Among the usual large number of exhibits provided for the entertainment and instruction of the visitors, Dr. Hele-Shaw showed models of his stream-line filter, which is said to be capable of remarkable results in the filtration of oil and even the removal of dyes from their solutions.

AN EXPLOSION occurred at the Gatebeck Gunpowder Works, Kendal, on Thursday, May 17, resulting in the death of two men who were engaged in granulating gunpowder. Only the day before H.M. Inspector of Explosive Works, Major Cunningham, had visited the works, which form part of Nobel Industries, Ltd. At the inquest the identity of the victims only was established, and the proceedings adjourned pending an investigation.

WE REGRET TO HEAR that Mr. H. C. Parmelee, editor of *Chemical and Metallurgical Engineering* (New York) and president of the American Association of Business Editors, is suffering from a temporary nervous breakdown, and has been resting for some time past in the southern part of the States. It is hoped among Mr. Parmelee's numerous friends that the rest will restore his health and enable him shortly to resume his duties.

THE AUSTRALIAN carbide industry has recently received a set-back in the closing of the works of the Hydro Electric Metallurgical Co., near Hobart, Tasmania. Started during the war the industry received official encouragement in the form of a complete prohibition on imports which has now been removed, and in spite of the protective tariff the industry has had to be abandoned owing to the dumping of cheap carbide as a result of over production in outside sources.

AT LEEDS COUNTY COURT on Thursday, May 17, Miss Ethelene Preston, of Upper Cross Street, Dewsbury, was awarded £21 damages against B. Hickman, hairdresser, of Boar Lane, Leeds, for injurious effects caused by the use of a hair dye supplied by the defendant. Dr. Paul, Public Analyst of Huddersfield, who had analysed two bottles of dye, said that one contained peroxide of hydrogen and was quite harmless, but the other contained paraphenylene diamine with ammonia.

THE ANNUAL MEETING of the Newcastle Section of the Society of Chemical Industry was held at Armstrong College on Wednesday, May 16th, when the chairman (Mr. A. Trobridge), the vice-chairman (Mr. J. H. Patterson), and the hon. secretary (Mr. H. Dunford Smith), together with the committee, were re-elected. Mr. W. M. Madgin read a paper, written in conjunction with Mr. H. V. A. Briscoe, on "The freezing-point curve for mixture of sodium nitrate and potassium nitrate." He said the curve had been determined several times before, but the authors were of opinion that previous determinations were inaccurate, and suggested an alternative form as a result of their experimental investigations.

AMONG the papers to be read at the Royal Society on Thursday, May 31, 1923, will be one on "The Measurement of Thermal Conductivity" (No. 1), by Dr. E. Griffiths and Dr. G. W. C. Kaye, communicated by Sir Joseph Petavel, F.R.S. The papers to be read in title only will include the following:—Professor E. F. Armstrong, F.R.S., and Dr. Hilditch, "A Study of Catalytic Actions at Solid Surfaces, Part XI.", "The Action of Alumina and certain other Oxides in Promoting the Activity of Nickel Catalyst." Mr. W. B. Rimmer, "The Spectrum of Ammonia," communicated by Professor A. Fowler, F.R.S., and "Benzine Derivatives," by Mr. N. K. Adam, communicated by Mr. W. B. Hardy.

IN THE COURSE of his speech on Wednesday, May 16, at the annual meeting of the British Cotton and Wool Dyers Association, the chairman (Dr. Hoegger) said that since the last annual meeting the distribution of reparation dyestuffs has been transferred from the Central Importing Agency to the British Dyestuffs Corporation, Limited. It had been stated in Parliament that this appointment was made with the approval of the Colour Users' Association. This statement, however, was quite incorrect. The negotiations were completed and notices to that effect appeared in the Press before the matter was ever discussed by the Colour Users' Association, he said. He did not make any complaint about the actual distribution of reparation dyes, as, in his opinion, that had been carried out in a most efficient manner. It was true that on many occasions they had had to pay more for reparation dyes than the price at which they could have obtained the same colours direct from Germany under licence.

Recent Wills

Sir James Dewar, of Albemarle Street, London, W., and of Peterhouse, Cambridge, Fullerian Professor of Chemistry and Resident Professor of the Royal Institution, Jacksonian Professor of Chemistry in the University of Cambridge, etc... £128,828

Mr. Joseph Taylor, Newstead, Blundellsands, Lancashire, formerly a director of the United Indigo and Chemical Co., Ltd..... £290,882

References to Current Literature

British

RUBBER.—Hard rubber in lined steel tanks. F. C. Zeisberg. *Rubber Age*, April, 1923, pp. 103–104.

Patents as they affect the rubber industry. H. E. Potts. *Rubber Age*, May, 1923, pp. 139–142.

Uses of rubber and gutta percha in cable manufacture. H. Savage. *Rubber Age*, May, 1923, pp. 161–165.

Investigations into rubber softeners. P. M. Aultman and C. O. North. *Rubber Age*, May, 1923, pp. 167–169.

What can be done in rubber research. B. D. Porritt. *Rubber Age*, April, 1923, pp. 105–113.

CALCIUM COMPOUNDS.—Heteromorphism of calcium carbonate. Marble, synthetic and metamorphic. M. Copisarow. *Chem. Soc. Trans.*, April, 1923, pp. 785–796.

Heteromorphism of calcium sulphate. Alabaster and its synthesis. M. Copisarow. *Chem. Soc. Trans.*, April, 1923, pp. 796–799.

AMMONIUM NITRATE.—The properties of ammonium nitrate. Part V. The reciprocal salt-pair, ammonium nitrate and potassium chloride. E. P. Perman and H. L. Saunders. *Chem. Soc. Trans.*, April, 1923, pp. 841–849.

ALKALOIDS.—Physostigmine. Part I. Alkylation products of eseroline. G. Barger and E. Stedman. *Chem. Soc. Trans.*, April, 1923, pp. 758–769.

OPTICALLY ACTIVE COMPOUNDS.—The molecular configurations of polynuclear aromatic compounds. Part II. 4 : 6 : 4¹—Trinitrodiphenic acid and its resolution into optically active components. G. H. Christie and J. Kenner. *Chem. Soc. Trans.*, April, 1923, pp. 779–785.

COMPLEX COMPOUNDS.—Co-ordination compounds and the Bohr atom. N. V. Sidgwick. *Chem. Soc. Trans.*, April, 1923, pp. 725–730.

SULPHATES.—The hydrogen sulphates of the alkali metals and ammonium. H. B. Dunnicliff. *Chem. Soc. Trans.*, April, 1923, pp. 731–738.

ALKYLATION.—The action of methyl sulphate on diphenylamine and on methyldiphenylamine. C. S. Gibson and D. C. Vining. *Chem. Soc. Trans.*, April, 1923, pp. 831–841.

GENERAL.—Symbols and formulæ. J. Walker. *Chem. Soc. Trans.*, April, 1923, pp. 939–946.

United States

CATALYSIS.—The catalytic ammonolysis of betanaphthol and chlorobenzene in the vapour state. A. M. Howald and A. Lowy. *J. Ind. Eng. Chem.*, April, 1923, pp. 397–401.

ORGANO-METALLIC COMPOUNDS.—Recent developments in the chemistry of organic mercury compounds. F. C. Whitmore. *J. Ind. Eng. Chem.*, April, 1923, pp. 417–419.

Development of the American arsphenamine industry. G. W. Raiziss. *J. Ind. Eng. Chem.*, April, 1923, pp. 413–415.

The reaction of organic mercury compounds with halides. Part I. Para-mercury ditolyl and sulphonyl halides. F. C. Whitmore and N. Thurman. *J. Amer. Chem. Soc.*, April, 1923, pp. 1068–1071.

FATS.—The analytical detection of rancidity. R. H. Kerr and D. G. Sorber. *J. Ind. Eng. Chem.*, April, 1923, pp. 383–385.

OXIDATION.—Recent investigations on the oxidation of sulphur by micro-organisms. J. G. Lipman. *J. Ind. Eng. Chem.*, April, 1923, pp. 404–405.

CRYSTALLOGRAPHY.—The crystal structure of tin tetraiodide. R. G. Dickinson. *J. Amer. Chem. Soc.*, April, 1923, pp. 958–962.

ANALYSIS.—Determination of small quantities of molybdenum in tungsten. W. J. King. *J. Ind. Eng. Chem.*, April, 1923, pp. 350–354.

The determination of ash in Cuban raw sugar. U. S. Jamison and J. R. Withrow. *J. Ind. Eng. Chem.*, April, 1923, pp. 386–389.

Quantitative determination of carbon and hydrogen in organic compounds with arsenic and with mercury. M. Falkov and G. W. Raiziss. *J. Amer. Chem, Soc.*, April, 1923, pp. 998–1003.

APPARATUS.—A new method for the control of thermostats. D. J. and J. J. Beaver. *J. Ind. Eng. Chem.*, April, 1923, pp. 359–361.

FOODSTUFFS.—The action of shortening in the light of the newer theories of surface phenomena. W. Platt and R. S. Fleming. *J. Ind. Eng. Chem.*, April, 1923, pp. 390–394.

ACIDS.—The physical properties of maleic, fumaric and malic acids. J. M. Weiss and C. R. Downs. *J. Amer. Chem. Soc.*, April, 1923, pp. 1003–1008.

The utilisation of para-dichlorobenzene for synthesis in the diphenic acid series. E. B. Hunn. *J. Amer. Chem. Soc.*, April, 1923, pp. 1024–1030.

French

CEMENTS.—Dental cements. A. Chaplet. *Rev. Chim. Ind.*, February, 1923, pp. 59–64.

WOOL FAT.—Suint; its obtention and utilisation in the crude and purified state. Part III. M. de Keghel. *Rev. Chim. Ind.*, February, 1923, pp. 53–58.

TANNING EXTRACTS.—The manufacture of tanning extracts. Part I. R. Sansonne. *Rev. Chim. Ind.*, March, 1923, pp. 89–91.

RESINS.—The varnish industry and furfurol resins. G. Meunier. *Rev. Chim. Ind.*, April, 1923, pp. 103–106.

SOAPS.—Particular methods of obtaining hard, soft and special soaps. Part I. M. de Keghel. *Rev. Chim. Ind.*, April, 1923, pp. 113–119.

German

COLOUR.—The colour of inorganic compounds. W. Biltz. *Z. anorg. u. allg. Chem.*, March 23, 1923, pp. 169–186.

COMPLEX COMPOUNDS.—Ammoniates of alkali metal halides. W. Biltz and W. Hansen. *Z. anorg. u. allg. Chem.*, March 13, 1923, pp. 1–33.

Density measurements with some simple and complex nickel and cobalt salts. W. Biltz and E. Birk. *Z. anorg. u. allg. Chem.*, March 13, 1923, pp. 34–42.

CATALYSIS.—The catalytic reduction of aliphatic azines. Part II. Reduction of dimethylketazine and isobutyraldazine in presence of acetic acid. K. A. Taipale. *Ber.*, April 11, 1923, pp. 954–962.

Further investigation of the catalytic dehydrogenation of hexahydro-aromatic hydrocarbons. N. Zelinsky. *Ber.*, April 11, 1923, pp. 787–788.

SILICATES.—Studies of silicates. Part I. The loss of water from kaolin and its behaviour in the solid state to the carbonates and oxides of alkaline earth metals. G. Tammann and W. Pape. *Z. anorg. u. allg. Chem.*, March 13, 1923, pp. 43–67.

HYDRATES.—The hydrates of antimony pentoxide. G. Jander and A. Simon. *Z. anorg. u. allg. Chem.*, March 13, 1923, pp. 68–82.

SILICON COMPOUNDS.—Silicon hydrides. Part XIV. Trichlor and tetrachlor-monosilane, $SiHCl_3$ and $SiCl_4$. A. Stock and F. Zeidler. *Ber.*, April 11, 1923, pp. 986–997.

ACIDS.—The constitution of truxillic and truxinic acids and the action of sunlight on cinnamic acid and its salts. A. W. K. de Jong. *Ber.*, April 11, 1923, pp. 818–832.

The precipitation of tungstic acid. J. A. M. van Liempt. *Z. anorg. u. allg. Chem.*, March 23, 1923, pp. 215–220.

TAR.—Tar. Part. II. F. Schütz, W. Buschmann and H. Wissebach. *Ber.*, April 11, 1923, pp. 869–874.

Lignite tar. E. Fromm and H. Eckard. *Ber.*, April 11, 1923, pp. 948–953.

CELLULOSE COMPOUNDS.—Cellulose xanthogenate. R. Wolffenstein and E. Oeser. *Ber.*, April 11, 1923, pp. 785–787.

THIONATES.—Constitution and energy content of potassium polythionates. F. Martin and L. Metz. *Z. anorg. u. allg. Chem.*, March 13, 1923, pp. 83–100.

TANTALUM COMPOUNDS.—Investigation of the supposed volatility of tantalic acid with hydrofluoric acid and of some tantalum compounds. O. Hahn and K. E. Pütter. *Z. anorg. u. allg. Chem.*, March 13, 1923, pp. 153–168.

RARE EARTHS.—The separation of rare earths by basic precipitation. Part V. Preparation of cerium, lanthanum and allied oxides from thorium-free monazite. W. Prandtl and J. Lösch. *Z. anorg. u. allg. Chem.*, March 23, 1923, pp. 209–214.

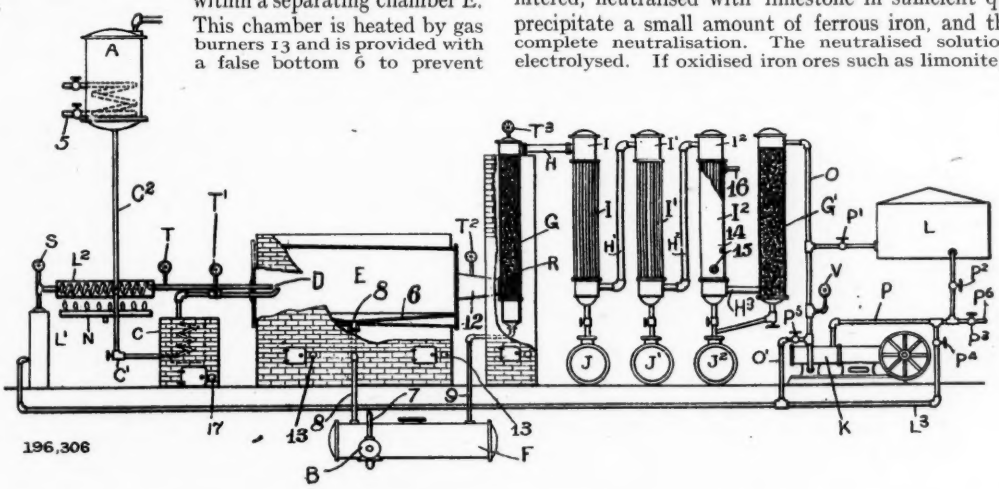
ANALYSIS.—Volumetric analysis of sulphites and thiosulphates by oxidation with bromine in statu nascendi. C. Mayr and J. Peyfuss. *Z. anorg. u. allg. Chem.*, March 13, 1923, pp. 123–136.

Patent Literature

Abstracts of Complete Specifications

196,306. Distilling and Fractionating Hydrocarbon Oils, Process and Means for. E. H. French, 1458, Worthington Street, Columbus, Ohio, U.S.A. Application date, October 17, 1921.

To convert heavy hydrocarbons into products of lower boiling point, small portions of the oil are heated to a temperature below the average boiling point of the fraction required, and then atomised and separated at this temperature. The separation may be effected in a vacuum. Crude oil passes from a tank A to a heater C, and then to a sprayer D within a separating chamber E. This chamber is heated by gas burners 13 and is provided with a false bottom 6 to prevent



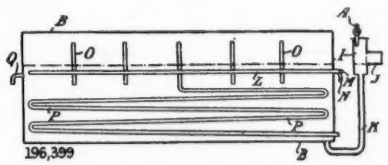
direct contact of the residue with the heated walls. The vapour passes through a tapered passage 12 to a heated scrubber G, and then through several tubular condensers I, I^1, I^2, scrubber G^1, and gas-holder L. The condensate from scrubber G discharges into a tank F, which also receives the residue from the separating vessel E. Collecting vessels J, J^1, J^2 are provided for the tubular condensers, and the temperatures of the latter are regulated by means of water jackets. The condensate from the scrubber G^1 passes into the receiver J^3. The air is first exhausted from the system by means of the pump K, and the system is then filled with inert gas through the gas-holder L. The temperature of the oil leaving the preheater C is regulated to suit the density of the oil which is treated. Several such apparatus may be combined to carry on continuous fractionation of the oil, and the temperatures in each unit are regulated to suit the fractions required. In this apparatus the part of the oil which is not volatilised in the separating chamber is immediately removed from this chamber, so that it is only subjected to heat for a sufficient time to volatilise the fraction required. If the oil treated is a lighter variety, the heating before atomisation may be dispensed with. Reference is directed in pursuance of Section 7, Sub-section 4 of the Patents and Designs Acts 1907 and 1919, to Specification Nos. 13,089/1891, 7,108/1897, and 107,502.

196,334. Electrolytic Iron. F. A. Eustis, 131, State Street, Boston, Mass., U.S.A. Application date, December 22, 1921.

The process is for obtaining iron by electrolysis from scrap iron or iron ore, or other material containing iron. The iron is deposited from ferrous chloride or ferrous sulphate solution, or any iron solution which will deposit iron and will attack the raw material containing the iron. The same liquor is used repeatedly in the process, first to dissolve out the iron, and then as an electrolyte. A diaphragm cell is used and the liquor from the anode compartment, which is a ferric solution or a ferric and ferrous solution, is reduced. This reduction may either be effected in contact with the scrap iron or a sulphide ore, or may be effected before the leaching process. The solution is neutralised with limestone, filtered, heated nearly to boiling point, and supplied to the cathode compartment of a cell. Iron is deposited on the cathode and the liquor passes through the disaphragm into the anode compartment. The diaphragm is preferably of asbestos cloth, which is permeable to the solution as well as to the iron, and the liquid level in the cathode compartment is maintained above that in the anode compartment, to ensure the flow of the liquor in the proper direction. It is necessary that the solution should be neutral, and that its temperature should be maintained about 95° C. When treating scrap iron, the anode liquor containing ferric and ferrous chlorides dissolves the iron and is reduced to ferrous chloride. The solution is filtered, neutralised with limestone in sufficient quantity to precipitate a small amount of ferrous iron, and thus ensure complete neutralisation. The neutralised solution is then electrolysed. If oxidised iron ores such as limonite, hematite, or magnetite are used, the ore is pulverised and treated with the ferrous solution at a temperature of at least 70° C., preferably by a counter-current method. If sulphide ores such as pyrites, pyrrhotite or marcasite are used, the anode liquor may be used as it comes from the electrolytic cell, and the ferric chloride is thereby reduced with precipitation of sulphur. When using some sulphide ores, it may be preferable to reduce the anode liquor before using it for leaching. Pure iron is obtained by this method.

196,399. Dehydration of Coal Tar. S. W. A. Wikner, Newcastle-upon-Tyne, and Gateshead Gas Co., 33, Grainger Street West, Newcastle-upon-Tyne. Application date, January 27, 1922.

Tar is dehydrated by means of a heating coil just below the surface within a tank. An excess of the tar is supplied through the pipe A to a chamber I having an overflow J,



and communicating by a pipe K with the bottom of the closed tank B, in which the level is that of the overflow J. Steam is passed through a series of pipes L arranged in a horizontal plane just below the surface level of the tar, and the water and other vapour driven off pass down downwards through pipes O to coils P, where the vapour is condensed and its heat is utilised in heating the tar. The dehydrated tar leaves the tank B by an outlet Q slightly below the level of the overflow J.

196,357. Atmospheric Nitrogen, Recovery of Fixed. T. Twynam, Teeswold, Coatham Road, Redcar, Yorks. Application date, January 19, 1922.

In the process of fixing atmospheric nitrogen by passing high tension electric sparks through air, nitric oxide is formed,

but the efficiency is low and the process is expensive unless electric power is very cheap. In this invention, it is found that in large gas engines, particularly those using coke oven gas, where the initial pressure is high, some combination of the nitrogen and oxygen takes place in the explosions. If the exhaust gases are cooled, mixed with a jet of water, and scrubbed, the nitrogen compounds may be condensed and removed. It is necessary to employ high compression in the engine, a high explosion temperature, and some excess of air over the theoretical quantity necessary. The exhaust gases are treated in apparatus composed of a low-carbon steel alloy containing about 12 per cent. of chromium, which is not acted upon by nitric acid. It is found that a satisfactory yield of oxides of nitrogen is not obtained from engines using blast furnace gas.

196,431. Organic Mercury Derivatives of Aurin Tricarboxylic Acid and their Alkali Salts. M. E. Wolvekamp, 1116, Second Avenue, Oakland, Cal., U.S.A. Application date, February 14, 1922.

The object is to obtain an antiseptic which will serve as a substitute for mercuric salicylate and also as a disinfectant. When the three hydrogen atoms of methyl alcohol are replaced by the three carbon atoms in *p*-position to the hydroxyl groups of three molecules of mercuric salicylate (anhydro hydroxy mercury salicylic acid) the anhydride of this product will be trimercuric aurin tricarboxylate (trianhydro hydroxy mercury aurin tricarboxylic acid). This product has similar medicinal properties to those of mercuric salicylate, but it is easily soluble in sodium chloride solution. If only one or two mercury atoms are introduced in aurin tricarboxylic acid, the resulting products are more powerful antiseptics. If a mixture of aurin tricarboxylic acid 1 gram molecule, mercuric oxide 1 gram molecule, sodium chloride 400 grams, and water 10 litres, is boiled for about three hours, a yield of 99 per cent. of monoanhydro hydroxy mercury aurin tricarboxylic acid is obtained. The di- and tri-mercuric compounds are obtained in a similar manner by using two or three grammolecules of mercuric chloride. Other examples are given of the method of obtaining these compounds without sodium chloride.

196,513. Horizontal and Inclined Retorts for the Distillation of Coal and Like Carbonaceous Substances. C. P. Tooley, 45, Stapleton Street, New Wortley, Leeds, and G. W. Tooley, 21, Woodlands Road, Cheetham Hill, Manchester. Application date, June 15, 1922.

The retorts are arranged in superposed tiers, the walls, the retorts in each horizontal row being connected together so that the hot gaseous products of combustion are compelled to flow in a zigzag path over each horizontal row in succession. The hot gases are admitted below the lowest horizontal row at one side, and below each alternate row. At the opposite side of every alternate horizontal row, inlets are provided for admitting secondary air, and air inlets are also provided adjacent to the gas inlets. Uniform distribution of heat is obtained by adjusting the two series of secondary air inlets. A number of such settings may be arranged side by side with gas producers at the ends of the series.

Note.—Abstracts of the following specifications, which are now accepted, appeared in The Chemical Age when they became open to inspection under the International Convention :—174,360 (F. Hosterther) relating to the manufacture of motor spirit, see Vol. VI., p. 433 ; 174,642-3 (H. Winternitz, T. Bullinger and G. Teichner) relating to a process of oxidising liquid hydrocarbons, see Vol. VI., p. 465 ; 182,084 (Soc. Anon. des Matieres Colorantes et Produits Chimiques de Saint Denis, A. R. Wahl, and R. Lantz) relating to the manufacture of 2-oxy-1-aryl-naphthylamines, see Vol. VII., p. 284 ; 182,459 (Consortium für Elektrochemische Industrie Ges.) relating to artificial resins, see Vol. VII., p. 355 ; 184,778 (Elektrizitatswerk Lonza) relating to a process of purifying acetylene, see Vol. VII., p. 570.

International Specifications not yet Accepted

194,719. Fatty Acid Anhydrides. Consortium für Elektrochemische Industrie Ges., 20, Zielstattstrasse, Munich, Germany. International Convention date, March 10, 1922.

Acetic acid vapour is passed over fireclay heated to 650° C. to obtain acetic anhydride. Propionic and butyric anhydrides are similarly obtained by heating the acids to temperatures above their boiling points. Other gases or vapours may be mixed with the acid vapour, or volatile hydrocarbons may be injected to cool the products quickly, and precipitate the water formed. Alkali or alkaline earth chlorides or sulphates, boric acid, or borates may be used as catalysts to facilitate the production of anhydrides.

194,723. Tanning Agent. M. Melamid, 9, Urachstrasse, Freiburg, Baden, Germany. International Convention date, March 11, 1922.

Waste sulphite liquor is esterified by heating with caustic soda and toluene sulphochloride to produce a tanning material.

195,033. Emulsions. P. M. Travis, 520, Nostrand Avenue, Brooklyn, New York, and C. A. Glabau, 149, Lawrence Avenue, Hasbrook Heights, N.J., U.S.A. International Convention date, March 17, 1922.

An emulsion of mineral oil, fat, or fatty oil and water is obtained by adding a very small proportion of a salt of a fatty acid, and then forcing at high pressure through a homogeniser. If water predominates, sodium or potassium oleate is used, and if oil predominates, calcium or magnesium oleate, which are soluble in oil, is used. The fatty acid salt is used in the proportion of 0·5–1·5 per cent.

195,061. Purifying Gases. T. P. L. Petit, 10, Schulpweg, Velsen, Holland. International Convention date, March 16, 1922.

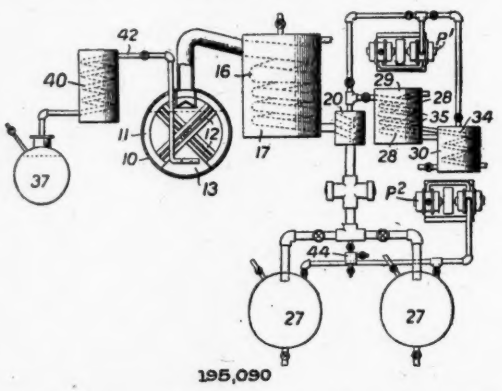
An alkali solution or a suspension of an alkaline earth is used to absorb sulphuretted hydrogen from gases. The liquor is then purified from sulphuretted hydrogen by means of carbon dioxide, and the carbon dioxide recovered for use again by heating the liquor or by passing steam through it. The absorbent is cooled by means of the liquor from the absorber, and used again.

195,077. Ferric Hydroxide. Waterloo Chemical Works, Ltd., 25, O'Connell Street, Sydney, Australia. International Convention date, March 15, 1922.

Sodium chloride solution containing a small quantity of sulphuric or other free acid, or an iron salt, is electrolysed with an iron anode. The process is continuous and the iron hydroxide obtained flows away continuously to a filter press while the filtrate is returned to the cell. The anode may be tin-plate, galvanised iron, or scrap, loose or pressed. The hydroxide is dried and roasted to obtain ferric hydroxide.

195,090. Distilling Hydrocarbon Oils. Red River Refining Co., Inc., Shreveport, U.S.A. Assignees of J. E. Schulze, Chicago, Ill., U.S.A. International Convention date, March 18, 1922.

The process is for distilling petroleum, shale oil, distillates and topped or residual oils to obtain lubricating oils. The still 10 is provided with cross braces 12 and peripheral ribs 11 interrupted at the base 13, to resist external pressure. Steam from a boiler 37 passes through a superheater 40 and is injected



195,090

into the still. The pressure is maintained below 5 m.m. of mercury absolute, and the distillate is fractionally condensed according to its viscosity, flash point, fire point, etc. The steam and vapour pass to a steam-heated condenser 17, baffle chamber 20, and receivers 27, the vacuum being maintained by a pump P^1. The uncondensed vapour passes to a condenser

28 and receiver 30, both of which are cooled by refrigerated brine. The vacuum pump P^2 restores the vacuum after the distillate is withdrawn from the receivers 27. Samples may be taken at 44.

195,084. EXTRACTING ALKALI AND ALUMINA FROM LEUCITE AND SIMILAR ROCKS. F. Jourdan, 186, Via del Babuino, Rome. International Convention date, March 16, 1922.

Leucite or other rock containing alkali and aluminium silicate is mixed with 70–120 per cent. of lime or calcium carbonate and fused in a kiln or rotary furnace at 1000–1400° C. The product is ground and the alkali aluminate dissolved out with water. Carbon dioxide is passed through the solution to obtain alumina and alkali carbonate.

195,089. COLLOIDAL FERRIC OXIDE. Aktieselskabet Hydropeat, 37, Raadhuspladsen, Copenhagen. Assignees of V. Brünig, 10, Konigin-Augustastrasse, Berlin. International Convention date, March 18, 1922.

Flue gases containing carbon dioxide are passed into water containing pieces of iron and steel, which are converted into ferrous bicarbonate. This may be treated with hypochlorous acid, chlorine or chlorine water, to obtain colloidal ferric oxide, which is suitable for dewatering peat, coagulating peat, purifying water or sewage liquor, mordanting fibres or tanning leather. The hypochlorous acid may be obtained by treating chloride of lime solution with carbon dioxide, or caustic lime with chlorine and then with carbon dioxide.

195,098. SEPARATING GASEOUS MIXTURES. Farbwerke vorm. Meister, Lucius v. Brüning, Hoechst-on-Main, Germany. International Convention date, March 20, 1922.

One or more of the components of a gaseous mixture is absorbed in active charcoal. The charcoal is carried on an endless band which moves transversely across the gas stream, the absorbed components being removed between successive passages across the gas stream. Alternatively the gas may pass over a stationary charcoal layer. An apparatus for absorbing and recovering several constituents of a gas mixture is described.

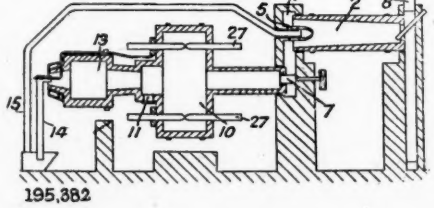
195,345. METHANE, CHLORINATION OF. Holzverkohlungs-Industrie, Akt.-Ges., Konstanz, Baden, Germany. International Convention date, March 27, 1922.

A mixture of methyl chloride, with some methylene chloride and chloroform, is obtained by the action of methane on antimony pentachloride at a temperature of 290°-350° C. If a catalyst such as copper, iron or calcium chloride is used, the temperature may be reduced to 250° C. Antimony trichloride is formed and is condensed and chlorinated for use again.

195,382. EXTRACTING ZINC. Dunford and Elliott (Sheffield) Ltd., Attercliffe Wharf Works, Sheffield, and A. H. Pehrson, 14B, Ostermalmsgatan, Stockholm. International Convention date, March 21, 1922.

A mixture of ore and carbonaceous reducing agent is fed into a rotary tapering chamber 2 in which it is preheated by a gas burner 5. The gases evolved pass into the chimney 8 and the ore passes into a chamber 4 from which it is fed by a screw 7 into a rotating reducing chamber 10. This chamber is heated by water-cooled electrodes 27, and the zinc vapour and carbon monoxide pass into a rotary condenser 13 to condense the zinc. The carbon monoxide is conveyed through

FIG.1.



195,382

water-sealed pipes 14, 15 to the burner 5. The reducing chamber may be extended to prolong the reducing action, additional electrodes being provided. The chambers 2 and 13 may be stationary.

LATEST NOTIFICATIONS.

197,632. Processes for vulcanising rubber with condensation products of ammonia and aldehydes as accelerators. Naugatuck Chemical Co. May 15, 1922.

197,647. Catalysers for the decomposition of water vapour and its utilisation for the obtainment of a combustible or explosive fluid. Laurent, C. E. May 13, 1922.

197,655. Process for the synthetic production of ammonia. Casale, Dr. L. May 13, 1922.

197,690. Process for the manufacture from cyanamide of manures containing soluble organic nitrogen. Soc. d' Etudes Chimiques pour l'Industrie. May 15, 1922.

Specifications Accepted, with Date of Application

171,684. Reclaiming sludge acid in petroleum refining, Process for. W. H. Simonson and O. Mantius. November 19, 1920.

177,777. Synthesis of ammonia by means of hyper-pressures. Soc. Chimique de la Grande Paroisse (Azote and Produits Chimiques). March 31, 1921.

178,842. Formaldehyde, Manufacture of. Consortium für Elektrochemische Industrie Ges. April 18, 1921.

186,572. Butyric acid and other fatty acids, Process for the manufacture of—with recovery of the gases of fermentation. Lefranc et Cie. September 26, 1921.

188,662. Stable compounds of calcium hypochlorite, Process for the production of. Chemische Fabrik Griesheim Elektron. November 8, 1921. Addition to 182,927.

189,432. Formaldehyde, Manufacture of. Farbwerke vorm. Meister, Lucius and Bruning. November 25, 1921.

195,046. Separation of the constituents of gaseous mixtures. L'Air Liquide Soc. Anon. pour l'Etude et l'Exploitation des Procédés G. Claude. March 16, 1922.

196,944. Separating minerals mechanically, Process of. Plauson's (Parent Co.), Ltd. (*H. Plauson*). October 28, 1921.

196,952, 196,953, 196,954 and 197,281. Cellulose ethers, Dyeing of. H. Dreyfus. November 30, 1921.

196,972. Gas generators. F. Umpleby and H. Powers. January 4, 1922.

196,993. Sulphurising organic compounds, Process for. F. W. Atack. January 31, 1922.

196,995. Automatically-acting lixiviation apparatus. G. Haglund. January 31, 1922.

197,033. Clarifying and sterilising trade waste waters, Process for—and extracting fats therefrom. A. J. de Raeve. February 7, 1922.

197,060. Colloidal sulpharsenites, Soluble preparations of. M. E. Wolvekamp. February 14, 1922.

197,061. Antimony sulphide, Colloidal compounds of. M. E. Wolvekamp. February 14, 1922.

197,069. Hydrocarbons, Production of. United Kingdom Oil Co., Ltd., G. F. Forwood, and J. G. Taplay. February 16, 1922. Addition to 128,255.

197,170. Electrodes for electrolysis. R. F. Woodburn. April 19, 1922.

197,193. Settings of vertical retorts for the distillation of carbonaceous materials. G. W. Tooley, and West's Gas Improvement Co., Ltd. May 10, 1922.

197,198. Caustic soda, Manufacture of. Courtaulds, Ltd., and R. O. Jones. May 16, 1922.

197,199. Catalysts more particularly for the synthesis of ammonia. L. Casale. May 16, 1922.

197,223. Chromate of soda, Manufacture of. E. Baumgartner. June 15, 1922.

Applications for Patents

Compagnie de Béthune. Manufacture of sulphovinic acid from ethylene. 12999. May 15. (France, June 8, 1922).

Compagnie de Béthune. Recuperation of by-products of distillation of coal. 13000. May 15. (France, January 11).

Dreyfus, C. Manufacture of articles of cellulose derivatives. 13340. May 18.

Dupuy, H. Distillation apparatus. 13022. May 15. (France, May 30, 1922.)

Durand and Huguenin Akt.-Ges. Manufacture of mordant dyestuffs. 13120. May 16. (Germany, May 20, 1922.)

Edwards, H. Metallurigcal treatment of tin ores, concentrates, etc. 13036. May 15.

Fairgrieve, J. G., and Indurit Products Co., Ltd. Production of articles of the phenol-formaldehyde condensation product type. 12969. May 15.

Hole, S. R. Production of finely-divided naphthalene, etc. 13130. May 16.

Imray, O. Y., and Society of Chemical Industry in Basle. Manufacture of intermediate products for azo dye-stuffs. 13246. May 17.

Salerni, E. M., and Salerni, P. M. Distillation, etc., of carbonaceous, etc., materials. 13033. May 15.

Takahashi, K. Process for transferring fat-soluble vitamin (vitamin A) from fatty matter to its organic solvents. 12889. May 14.

Market Report and Current Prices

Our Market Report and Current Prices are exclusive to THE CHEMICAL AGE, and, being independently prepared with absolute impartiality by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., may be accepted as authoritative. The prices given apply to fair quantities delivered ex wharf or works, except where otherwise stated. The current prices are given mainly as a guide to works managers, chemists, and chemical engineers ; those interested in close variations in prices should study the market report.

London, May 23, 1923.

TRADE has been somewhat under the influence of the holidays this week, and there is little of interest to report. Business continues on the slow side with prices nominally unchanged. Stocks continue light.

Export inquiry is moderately active but not a great amount of business has been concluded.

General Chemicals

ACETONE has been in fair demand with price unchanged.

ACID, ACETIC.—Very firm with stocks light.

ACID, CITRIC.—Quietly steady with only a moderate business.

ACID, FORMIC is scarce but demand is light.

ACID, OXALIC has been in better request.

ACID, TARTATIC, is inclined to be slow but price well maintained.

ARSENIC.—Unchanged.

BARIUM CHLORIDE.—Weak and in small demand.

CREAM OF TARTAR.—Active with price well maintained.

FORMALDEHYDE.—Very firm and in light supply with demand moderate.

LEAD ACETATE has been a bright spot and price inclined to go higher.

METHYL ALCOHOL is in slightly better supply and inquiry is brisk.

POTASSIUM CARBONATE is very firm.

POTASSIUM CAUSTIC.—Unchanged.

POTASSIUM PERMANGANATE is well called for.

POTASSIUM PRUSSIATE seems to have stabilised recently at figures quoted, and is in good demand.

SODIUM ACETATE is very firm, and all available supplies are quickly snapped up.

SODIUM BICHROMATE has been in better request and price is firm.

SODIUM HYPOSULPHITE is only in moderate demand, at English makers' figures.

SODIUM NITRITE.—Without change in value and in small request.

SODIUM PHOSPHATE.—More active and price firm.

SODIUM PRUSSIATE.—Very quiet, with value inclined to be easier.

SODIUM SULPHIDE.—There is keen competition for all available business, but all the same, substantial orders have been booked.

ZINC OXIDE tends in buyers' favour.

Pharmaceutical Chemicals

Owing to the Whitsun holidays business has been very quiet, and there are consequently no important changes in price to report.

Coal Tar Intermediates

Business during the last week has been interfered with by the holiday, but a fair amount of inquiry continues to be received.

ALPHA NAPHTHOL has been inquired for from the Continent and home trade continues quite fair.

ALPHA NAPHTHYLAMINE.—Some small home business is reported.

ANILINE OIL continues to pass regularly into consumption.

ANILINE SALT.—Stocks are short for prompt delivery, and fair inquiry has been received.

BENZIDINE BASE.—Some inquiry is reported, but there is not much actual business moving.

BETA NAPHTHOL continues without change.

"H" ACID is steady.

METAPHENYLENEDIAMINE.—Some orders have been booked.

METATOLUILENEDIAMINE is without change.

ORTHO AMIDO PHENOL has been in demand on export account.

PHTHALIC ANHYPRIDE.—Fair inquiries have been received.

RESORCIN is quiet.

SULPHANILIC ACID.—Home buyers have been interested.

Coal Tar Products

A certain amount of easiness is apparent in one or two of the principal tar products. Possibly this is due to lack of business through prices having obtained such a high level that buyers hesitate to buy.

90% BENZOL is slightly better, and is worth 1s. 7d. per gallon on rails.

PURE BENZOL has no great demand, but is steady at 2s. 1d. per gallon on rails in the north, and 2s. 4d. to 2s. 5d. per gallon in the south.

CREOSOTE OIL is in slightly less demand, but is still quoted at 8½d. per gallon on rails in the north, and 9d. per gallon in the south.

CRESYLIC ACID is steady at 2s. 2d. per gallon on rails for the pale quality 97/99%, while the dark quality 95/97% is worth 1s. 10d. to 1s. 11d. per gallon.

SOLVENT NAPHTHA is of little interest, and is still worth about 1s. 4d. per gallon on rails.

HEAVY NAPHTHA is steady at 1s. 6d. per gallon on rails.

NAPHTHALENE maintains its easier tone, the better qualities being worth from £12 to £13 per ton, while the lower melting points are quoted at £7 10s. to £9 per ton.

PITCH.—Business is practically at a standstill, and prices are more or less nominal at 140s. to 150s., f.o.b., London ; 135s. to 140s., f.o.b., East and West Coast ports.

Sulphate of Ammonia

SULPHATE OF AMMONIA remains in good demand for export, and prices are well maintained.

[Current Market Prices on following pages.]

British Firms Exporting to Russia

The Department of Overseas Trade has been requested by the Russian Trade Delegation in London to publish the following information for the guidance of British firms exporting to Russia :—

The Russian Trade Delegation has been recently approached by a number of British firms with requests for import licences for goods which have already been dispatched to Russia, the consignors being apparently unaware of the regulations at present in force in that country, which are rendered necessary by the Soviet Government's monopoly of foreign trade. While these unlicensed consignments have doubtless been made in good faith, the Russian Customs authorities have no option but to detain the goods on arrival at the frontier, and their delivery to the consignee can only take place when a licence issued by the Russian Trade Delegation is produced to the Customs officials.

In order to prevent any possible future misunderstanding the Russian Trade Delegation wishes to state that, whatever previous correspondence may have taken place between firms and individuals in Russia and those in this country, in no circumstances should goods be consigned to Russia without an import licence having previously been obtained from the Delegation, whose address is 49, Moorgate, London, E.C.2. It is understood that no exception will be made to this rule, which will be adhered to in every case.

The Industrial Outlook for Colloid Chemistry

ACCORDING to a paper by Mr. H. N. Holmes, of the American Chemical Society, probable industrial developments in connection with colloids which may be looked for in the near future are : (*a*) Plauson colloid mill ; (*b*) adsorbent gels for water, sulphur dioxide, for preferentially adsorbing "gasolene," benzine, oxides of nitrogen, materials from liquids; (*c*) sulpnite pulp waste ; (*d*) syneresis ; (*e*) smoke settling, (*f*) emulsions ; (*g*) differential wetting power ; (*h*) lubrication ; (*i*) carbon black and lamp black ; (*j*) glass and enamel ; (*k*) paper and paints.

Current Market Prices

General Chemicals

	Per	£	s.	d.		£	s.	d.
Acetic anhydride, 90–95%	lb.	0	1	5	to	0	1	6
Acetone oil	ton	90	0	0	to	95	0	0
Acetone, pure	ton	121	0	0	to	125	0	0
Acid, Acetic, glacial, 99–100%	ton	69	0	0	to	70	0	0
Acetic, 80% pure	ton	50	0	0	to	51	0	0
Acetic, 40% pure	ton	25	0	0	to	26	0	0
Arsenic, liquid, 2000 s.g.	ton	100	0	0	to	105	0	0
Boric, commercial	ton	50	0	0	to	55	0	0
Carbolic, cryst. 39–40%	lb.	0	1	8	to	0	1	9
Citric	lb.	0	1	10	to	0	1	10½
Formic, 80%	ton	52	10	0	to	53	0	0
Hydrofluoric	lb.	0	0	7½	to	0	0	8½
Lactic, 50 vol.	ton	41	0	0	to	43	0	0
Lactic, 60 vol.	ton	43	0	0	to	44	0	0
Nitric, 80 Tw.	ton	27	0	0	to	28	0	0
Oxalic	lb.	0	0	6½	to	0	0	6¾
Phosphoric, 1.5	ton	35	0	0	to	38	0	0
Pyrogallic, cryst.	lb.	0	5	9	to	0	6	0
Salicylic, Technical	lb.	0	1	9	to	0	2	0
Sulphuric, 92–93%	ton	6	0	0	to	7	0	0
Tannic, commercial	lb.	0	2	3	to	0	2	9
Tartaric	lb.	0	1	5	to	0	1	5½
Alum, lump	ton	12	10	0	to	13	0	0
Chrome	ton	28	0	0	to	29	0	0
Alumino ferric	ton	7	0	0	to	7	5	0
Aluminium, sulphate, 14–15%	ton	8	10	0	to	9	0	0
Sulphate, 17–18%	ton	10	10	0	to	11	0	0
Ammonia, anhydrous	lb.	0	1	6	to	0	1	8
.880	ton	32	0	0	to	34	0	0
.920	ton	22	0	0	to	24	0	0
Carbonate	lb.	0	0	4	to	0	0	4½
Chloride	ton	50	0	0	to	55	0	0
Muriate (galvanisers)	ton	35	0	0	to	37	10	0
Nitrate (pure)	ton	35	0	0	to	40	0	0
Phosphate	ton	68	0	0	to	70	0	0
Sulphocyanide, commercial 90%	lb.	0	1	1	to	0	1	3
Amyl acetate	ton	175	0	0	to	185	0	0
Arsenic, white powdered	ton	75	0	0	to	78	0	0
Barium, carbonate, Witherite	ton	5	0	0	to	6	0	0
Carbonate, Precip.	ton	15	0	0	to	16	0	0
Chlorate	ton	65	0	0	to	70	0	0
Chloride	ton	17	0	0	to	17	10	0
Nitrate	ton	33	0	0	to	35	0	0
Sulphate, blanc fixe, dry	ton	20	10	0	to	21	0	0
Sulphate, blanc fixe, pulp	ton	10	5	0	to	10	10	0
Sulphocyanide, 95%	lb.	0	1	0	to	0	1	1
Bleaching powder, 35–37%	ton	10	10	0	to	11	0	0
Borax crystals	ton	28	0	0	to	32	0	0
Calcium acetate, Brown	ton	11	10	0	to	12	0	0
Grey	ton	19	15	0	to	20	0	0
Carbide	ton	16	0	0	to	17	0	0
Chloride	ton	6	0	0	to	7	0	0
Carbon bisulphide	ton	35	0	0	to	40	0	0
Casein technical	ton	100	0	0	to	105	0	0
Cerium oxalate	lb.	0	3	0	to	0	3	6
Chromium acetate	lb.	0	1	1	to	0	1	3
Cobalt acetate	lb.	0	6	0	to	0	6	6
Oxide, black	lb.	0	9	6	to	0	10	0
Copper chloride	lb.	0	1	2	to	0	1	3
Sulphate	ton	27	0	0	to	28	0	0
Cream Tartar, 98–100%	ton	97	10	0	to	100	0	0
Epsom salts (*see* Magnesium sulphate)								
Formaldehyde, 40% vol.	ton	92	10	0	to	95	0	0
Formusol (Rongalite)	lb.	0	2	1	to	0	2	2
Glauber slats, commercial	ton	5	0	0	to	5	10	0
Glycerin crude	ton	65	0	0	to	67	10	0
Hydrogen peroxide, 12 vols.	gal	0	2	2	to	0	2	3
Iron perchloride	ton	28	0	0	to	30	0	0
Sulphate (Copperas)	ton	3	10	0	to	4	0	0
Lead acetate, white	ton	43	0	0	to	45	0	0
Carbonate (White Lead)	ton	45	0	0	to	48	0	0
Nitrate	ton	44	10	0	to	45	0	0
Litharge	ton	45	0	0	to	46	0	0
Lithophone, 30%	ton	22	10	0	to	23	0	0
Magnesium chloride	ton	4	15	0	to	5	0	0
Carbonate, light	cwt.	2	10	0	to	2	15	0
Sulphate (Epsom salts commercial)	ton	6	10	0	to	7	0	0
Sulphate (Druggists')	ton	10	0	0	to	11	0	0
Manganese Borate, commercial	ton	65	0	0	to	75	0	0
Sulphate	ton	58	0	0	to	60	0	0
Methyl acetone	ton	78	0	0	to	80	0	0
Alcohol, 1% acetone	ton	105	0	0	to	110	0	0
Nickel sulphate, single salt	ton	40	0	0	to	41	0	0
Ammonium sulphate, double salt	ton	40	0	0	to	41	0	0
Potash, Caustic	ton	35	0	0	to	36	0	0
Potassium bichromate	lb.	0	0	5¾	to	0	0	6
Carbonate, 90%	ton	31	0	0	to	32	0	0
Chloride, 80%	ton	9	10	0	to	10	10	0
Chlorate	lb.	0	0	4½	to	0	0	4½
Metabisulphite, 50–52%	ton	80	0	0	to	85	0	0
Nitrate, refined	ton	43	0	0	to	45	0	0
Permanganate	lb.	0	0	10½	to	0	0	11
Prussiate, red	lb.	0	3	6	to	0	4	0
Prussiate, yellow	lb.	0	1	4½	to	0	1	5
Sulphate, 90%	ton	10	10	0	to	11	0	0
Salammoniac, firsts	cwt.	3	3	0	to		—	
Seconds	cwt.	3	0	0	to		—	
Sodium acetate	ton	24	15	0	to	25	0	0
Arsenate, 45%	ton	48	0	0	to	50	0	0
Bicarbonate	ton	10	10	0	to	11	0	0
Bichromate	lb.	0	0	4½	to	0	0	4¾
Bisulphite, 60–62%	ton	21	0	0	to	23	0	0
Chlorate	lb.	0	0	3½	to	0	0	3¾
Caustic, 70%	ton	19	10	0	to	20	0	0
Caustic, 76%	ton	20	10	0	to	21	0	0
Hydrosulphite, powder	lb.	0	1	5	to	0	1	6
Hyposulphite, commercial	ton	10	10	0	to	11	0	0
Nitrite, 96–98%	ton	28	0	0	to	29	0	0
Phosphate, crystal	ton	16	10	0	to	17	0	0
Perborate	lb.	0	1	0	to	0	1	1
Prussiate	lb.	0	0	8	to	0	0	8½
Sulphide, crystals	ton	10	10	0	to	11	0	0
Sulphide, solid, 60–62 %	ton	16	10	0	to	17	10	0
Sulphite, cryst.	ton	12	10	0	to	13	0	0
Strontium carbonate	ton	50	0	0	to	55	0	0
Nitrate	ton	40	0	0	to	42	0	0
Sulphate, white	ton	6	10	0	to	7	10	0
Sulphur chloride	ton	25	0	0	to	27	10	0
Flowers	ton	11	10	0	to	12	10	0
Roll	ton	11	0	0	to	12	0	0
Tartar emetic	lb.	0	1	2	to	0	1	3
Tin perchloride, 33%	lb.	0	1	2	to	0	1	4
Perchloride, solid	lb.	0	1	5	to	0	1	7
Protochloride (tin crystals)	lb.	0	1	4	to	0	1	5
Zinc chloride 102° Tw.	ton	20	0	0	to	21	0	0
Chloride, solid, 96–98%	ton	25	0	0	to	30	0	0
Oxide, 99%	ton	40	0	0	to	42	0	0
Dust, 90%	ton	45	0	0	to	47	10	0
Sulphate	ton	16	0	0	to	17	0	0

Pharmaceutical Chemicals

Acetyl salicylic acid	lb.	0	3	3	to	0	3	6
Acetanilid	lb.	0	1	6	to	0	1	9
Acid, Gallic, pure	lb.	0	3	0	to	0	3	3
Lactic, 1.21	lb.	0	2	6	to	0	3	0
Salicylic, B.P.	lb.	0	2	2	to	0	2	6
Tannic, leviss	lb.	0	3	4	to	0	3	6
Amidol	lb.	0	8	3	to	0	8	6
Amidopyrin	lb.	0	13	3	to	0	13	6
Ammon ichthosulphonate	lb	0	2	0	to	0	2	3
Barbitone	lb.	0	18	6	to	0	19	6
Beta naphthol resublimed	lb.	0	1	9	to	0	2	0
Bromide of ammonia	lb.	0	0	9	to	0	0	10
Potash	lb.	0	0	8½	to	0	0	9
Soda	lb.	0	0	9	to	0	0	9½
Caffeine, pure	lb.	0	12	0	to	0	12	3
Calcium glycerophosphate	lb.	0	5	9	to	0	6	0
Lactate	lb.	0	2	0	to	0	2	3
Calomel	lb.	0	4	9	to	0	5	0
Chloral hydrate	lb.	0	3	10½	to	0	4	0
Cocaine alkaloid	oz.	0	18	0	to	0	18	6
Hydrochloride	oz.	0	14	9	to	0	15	0
Corrosive sublimate	lb.	0	4	3	to	0	4	6
Eucalyptus oil, B.P. (70–75% eucalyptol)	lb.	0	1	6	to	0	1	6½
B.P. (75–80% eucalyptol)	lb.	0	1	7	to	0	1	7½
Guaiacol carbonate	lb.	0	8	6	to	0	8	9
Liquid	lb.	0	9	6	to	0	10	0
Pure crystals	lb.	0	10	3	to	0	10	6
Hexamine	lb.	0	4	0	to	0	4	3
Hydroquinone	lb.	0	3	6	to	0	3	9
Lanoline anhydrous	lb.	0	0	7	to	0	0	7½
Lecithin ex ovo	lb.	0	18	6	to	1	0	0
Lithi carbonate	lb.	0	9	6	to	0	10	0
Methyl salicylate	lb.	0	2	6	to	0	2	10
Metol	lb.	0	10	6	to	0	11	6
Milk sugar	cwt.	4	10	0	to	4	12	6
Paraldehyde	lb.	0	1	6	to	0	1	9
Phenacetin	lb.	0	6	3	to	0	6	9
Phenazone	lb.	0	7	9	to	0	8	0
Phenolphthalein	lb.	0	5	6	to	0	5	9
Potassium sulpho guaiacolate	lb.	0	5	0	to	0	5	3
Quinine sulphate, B.P.	oz.	0	2	3			—	

	Per	£	s.	d.		£	s.	d.
Resorcine, medicinal	lb.	0	5	6	to	0	5	9
Salicylate of soda powder	lb.	0	2	6	to	0	2	9
Crystals	lb.	0	2	9	to	0	3	0
Salol	lb.	0	2	9	to	0	3	0
Soda Benzoate	lb.	0	2	3	to	0	2	6
Sulphonal	lb.	0	14	6	to	0	15	0
Terpene hydrate	lb.	0	1	9	to	0	2	0
Theobromine, pure	lb.	0	12	0	to	0	12	6
Soda salicylate	lb.	0	7	9	to	0	8	3
Vanillin	lb.	1	3	6	to	1	4	6

Coal Tar Intermediates, &c.

Alphanaphthol, crude	lb.	0	2	0	to	0	2	3
Refined	lb.	0	2	6	to	0	2	9
Alphanaphthylamine	lb.	0	1	6	to	0	1	7
Aniline oil, drums extra	lb.	0	0	9½	to	0	0	10
Salts	lb.	0	0	9½	to	0	0	10
Anthracene, 40–50%	unit	0	0	8½	to	0	0	9
Benzaldehyde (free of chlorine)	lb.	0	3	0	to	0	3	3
Benzidine, base	lb.	0	5	0	to	0	5	3
Sulphate	lb.	0	3	9	to	0	4	0
Benzoic acid	lb.	0	2	0	to	0	2	3
Benzyl chloride, technical	lb.	0	2	0	to	0	2	3
Betanaphthol	lb.	0	1	1	to	0	1	2
Betanaphthylamine, technical	lb.	0	4	0	to	0	4	3
Croceine Acid, 100% basis	lb.	0	3	3	to	0	3	6
Dichlorbenzol	lb.	0	0	9	to	0	0	10
Diethylaniline	lb.	0	4	6	to	0	4	9
Dinitrobenzol	lb.	0	1	1	to	0	1	2
Dinitrochlorbenzol	lb.	0	0	11	to	0	1	0
Dinitronaphthalene	lb.	0	1	4	to	0	1	5
Dinitrotoluol	lb.	0	1	4	to	0	1	5
Dinitrophenol	lb.	0	1	7	to	0	1	9
Dimethylaniline	lb.	0	3	0	to	0	3	3
Diphenylamine	lb.	0	3	9	to	0	4	0
H-Acid	lb.	0	5	0	to	0	5	3
Metaphenylenediamine	lb.	0	4	0	to	0	4	3
Monochlorbenzol	lb.	0	0	10	to	0	1	0
Metanilic Acid	lb.	0	5	9	to	0	6	0
Metatoluylenediamine	lb.	0	4	0	to	0	4	3
Monosulphonic Acid (2.7)	lb.	0	5	6	to	0	6	0
Naphthionic acid, crude	lb.	0	2	3	to	0	2	6
Naphthionate of Soda	lb.	0	2	6	to	0	2	9
Naphthylamin-di-sulphonic-acid	lb.	0	4	0	to	0	4	3
Nevill: Winther Acid	lb.	0	7	3	to	0	7	9
Nitrobenzol	lb.	0	0	8	to	0	0	8
Nitronaphthalene	lb.	0	1	0	to	0	1	1
Nitrotoluol	lb.	0	0	8	to	0	0	9
Orthoamidophenol base	lb.	0	12	0	to	0	12	6
Orthodichlorbenzol	lb.	0	1	0	to	0	1	1
Orthotoluidine	lb.	0	0	10	to	0	0	11
Orthonitrotoluol	lb.	0	0	3	to	0	0	4
Para-amidophenol, base	lb.	0	8	6	to	0	9	0
Hydrochlor	lb.	0	7	6	to	0	8	0
Paradichlorbenzol	lb.	0	0	6	to	0	0	7
Paranitraniline	lb.	0	2	7	to	0	2	9
Paranitrophenol	lb.	0	2	3	to	0	2	6
Paranitrotoluol	lb.	0	2	9	to	0	3	0
Paraphenylenediamine, distilled	lb.	0	12	0	to	0	12	6
Paratoluidine	lb.	0	5	9	to	0	6	3
Phthalic anhydride	lb.	0	2	6	to	0	2	9
Resorcin, technical	lb.	0	4	0	to	0	4	3
Sulphanilic acid, crude	lb.	0	0	10	to	0	0	11
Tolidine, base	lb.	0	7	3	to	0	7	9
Mixture	lb.	0	2	6	to	0	2	9

Essential Oils and Synthetics

THESE markets have been absolutely quiet this week and there is no change in prices to report.

Essential Oils.		£	s.	d.
Anise	c.i.f. 1/10 spot	0	2	0
Bay		0	12	0
Bergamot		0	12	0
Cajaput		0	3	9
Camphor, white	per cwt.	4	0	0
Brown	„	3	15	0
Cassia	firmer, c.i.f. 7/9 spot	0	8	6
Cedarwood		0	1	6
Citronella (Ceylon)		0	3	2
(Java)	but forward quotations are easier	0	4	0
Clove	easier	0	7	6
Eucalyptus	dearer and very firm	0	1	8
Geranium Bourbon	firm	1	10	0
Lavender	very firm	0	12	6
Lavender spike		0	3	0
Lemon		0	3	0
Lemongrass	dull per oz.	0	0	2½
Lime (distilled)	very firm	0	3	6
Orange sweet (Sicilian)		0	11	0
(West Indian)		0	10	0
Palmarosa	very firm	0	17	6
Peppermint (American)		0	13	0
Mint (dementholised Japanese)		0	6	6
Patchouli		1	12	0
Otto of Rose	per oz.	1	4	0
Rosemary		0	1	8
Sandalwood		1	6	0
Sassafras		0	5	0
Thyme	as to quality 2/6 to	0	8	0

Synthetics.				
Benzyl acetate		0	3	0
Benzoate		0	3	0
Citral		0	10	0
Coumarine	firm	0	16	0
Heliotropine	firm	0	7	6
Ionone		1	5	0
Linalyl acetate		1	2	6
Methyl salicylate		0	2	6
Musk xylol		0	9	0
Terpeniol		0	3	1

Manchester Chemical Market

[FROM OUR OWN CORRESPONDENT.]

Manchester, May 24, 1923.

IF the chemical trade here were to be judged from the amount of business that has been put through this week matters would indeed be black. Throughout the city business houses have only opened on an average about two days in the week, but for all practical purposes they might just as well have closed down altogether. Business has been so quiet that it is difficult to get a fair idea of the market position and values. In some cases prices have shown a weakening tendency, but in others, particularly where supplies are on the short side, a further hardening is reported. Where the demand is reasonably steady, both from home consuming industries and from foreign shipment, as, for example, in the case of ammonia alkali, bleaching powder, caustic soda, and saltcake, prices are well maintained and show no signs of weakness. Acetic acid and the acetates have taken on additional firmness. Acetic acid, 80 per cent. technical, is now quoted at up to £48 per ton, while acetate of soda has advanced to £25, and grey and brown acetate of lime to £21 and £11 per ton respectively. Prussiates are rather easier, yellow prussiate of potash being down to 1s. 4d. to 1s. 4½d. per lb. Coal-tar products generally are also on the easy side. The f.o.b. Manchester quotation for pitch is now between £6 and £6 10s. per ton, while creosote oil has been shaded down to 8½d. to 9d. per gallon. In all other respects the market prices for chemicals are unchanged from last week.

Progress in the Dyestuffs Industry

A CONTRIBUTOR to the *Manchester Guardian Commercial* Textile Supplement last week is of the opinion that the progress which has been realised since the war in the British dyestuffs industry has been in a large measure the direct result of the late Lord Moulton's wisdom and foresight. It is practically certain that but for the passing of the Dyestuffs Bill in December, 1920, the industry would, within a comparatively short period have been gravely affected by foreign competition, and would have receded, though not to its pre-war level. The Dyestuffs Act gave our manufacturers breathing space to develop, and to their credit it must be said that they have taken full advantage of their opportunity. Some of the firms are well organised, and the quality of their products is generally good or improving, so that in due course of time, should the Dyestuffs Act be repealed or amended, they may be able to hold their own in open competition with the world. According to a recent computation, the British makers now supply some 80 per cent. of the dyewares required for the home industries.

The last ten years have seen relatively few innovations in the artificial colour industry. During this period Germany has been very barren in startling discoveries. Switzerland has produced more, while this country may lay claim to having put on the market some entirely new and useful products.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.*

Glasgow, May 23, 1923.

BUSINESS in the Heavy Chemical market continues quiet, and there is nothing of importance to record.

Prices for spot material of Continental origin are firm, but offers for forward delivery slightly easier.

Industrial Chemicals

ACETONE.—Supplies are more plentiful and some large business has been transacted for forward delivery at a concession in price.

ACID, ACETIC.—Glacial, 98/100%, £61 to £67 per ton; 80%, pure, £48 to £49 per ton; 80%, technical, £46 to £48 per ton, c.i.f. U.K. duty free.

ACID, BORACIC.—Crystal or granulated, £50 per ton; powdered, £52 per ton, carriage paid U.K. stations.

ACID, CARBOLIC.—Ice crystals quoted 1s. 5½d. per lb. Moderate inquiry.

ACID, FORMIC, 80%.—Unchanged at about £51 per ton, ex works.

ACID, HYDROCHLORIC.—Remains 6s. 6d. per carboy, ex works.

ACID, NITRIC, 84°.—£27 10s. per ton, ex station, full truck loads.

ACID, OXALIC.—Unchanged at about 6½d. per lb., ex store.

ACID, SULPHURIC.—144°, £3 15s. per ton; 168°, £7 per ton, ex works, full truck loads. Dearsenicated quality £1 per ton extra.

ACID, TARTARIC.—Now quoted 1s. 4d. per lb., ex wharf; 1s. 3¾d. per lb. forward delivery.

ALUM, LUMP POTASH.—Unchanged at about £12 10s. per ton, ex store. Offered from Continent at £10 per ton, c.i.f. U.K.

ALUM, CHROME.—Offered at £24 to £27 per ton, according to quality, f.o.b. U.K.

ALUMINA, SULPHATE.—14/15%, £7 17s. 6d. per ton; 17/18%, £10 15s. per ton, c.i.f. U.K., early delivery.

AMMONIA, ANHYDROUS.—Unchanged at 1s. 6d. per lb., ex station.

AMMONIA, CARBONATE.—Lump, 4d. per lb.; ground, 4¼d. per lb., delivered.

AMMONIA, LIQUID, 880°.—Quoted 3½d. per lb., ex station.

AMMONIA, MURIATE.—Grey galvanisers, quality unchanged at about £32 per ton, f.o.r.; fine white crystals offered from the Continent at £25 per ton, c.i.f. U.K.

AMMONIA, SULPHATE.—25¼%, £15 10s. per ton; 25¾% neutral, £16 13s. per ton, ex works. May delivery.

ARSENIC, WHITE POWDERED.—Unchanged at about £76 per ton, ex store. French arsenic guaranteed 99% offered at £65 per ton, c.i.f., U.K. port.

BARIUM CHLORIDE.—98/100% white crystals on offer at £14 15s. per ton, ex wharf, early dleivery.

BARYTES.—Finest white English £5 5s. per ton, ex works.

BLEACHING POWDER.—£11 7s. 6d. per ton, ex station, spot delivery. Contracts, 20s. per ton less.

CALCIUM CHLORIDE.—English make, £5 12s. 6d. per ton, ex quay or station. Continental about £4 15s. per ton, c.i.f., U.K.

COPPERAS, GREEN.—In little demand. Price about £2 10s. per ton, f.o.b. U.K.

FORMALDEHYDE 40%.—Moderate inquiry. Offered at £88 per ton, ex wharf.

GLAUBER SALTS.—Fine white cystals quoted £2 10s. per ton, c.i.f. U.K. Spot lots £3 17s. 6d. per ton, ex store.

LEAD, RED.—English makers price, £41 per ton, carriage paid, U.K. stations. Foreign material about £35 per ton, ex store.

LEAD, WHITE.—Italian make offered at £39 10s. per ton, c.i.f. U.K.

LEAD, ACETATE.—White crystals about £43 per ton; brown offered at £39 per ton, ex wharf, early delivery.

LEAD NITRATE.—On offer at £39 per ton. c.i.f. U.K.

MAGNESITE, GROUND CALCINED.—English make £8 10s. per ton, ex station. Continental £7 10s. per ton, c.i.f. U.K.

MAGNESIUM CHLORIDE.—Offered from Continent at £2 5s. per ton, c.i.f. U.K. Spot lots about £3 5s. per ton, ex store.

MAGNESIUM SULPHATE (Epsom Salts).—Commercial crystals, £7 per ton; B.P. crystals, £8 10s. per ton, delivered.

POTASH, CAUSTIC 88/92%.—Moderate inquiry. Now quoted £33 10s. per ton, ex store.

POTASSIUM BICHROMATE.—Unchanged at 5¾d. per lb.

POTASSIUM CARBONATE.—96/98%, £34 per ton; 90/92%, £29 per ton, ex store, spot delivery.

POTASSIUM CHLORATE.—Crystals or powdered, 3d. per lb., ex store.

POTASSIUM NITRATE (Saltpetre).—Little inquiry. Price about £32 per ton, ex store.

POTASSIUM PERMANGANATE.—B.P. crystals about 11¼d. per lb.

POTASSIUM PRUSSIATE (Yellow).—Inclined to be higher at 1s. 4¾d. per lb., ex store.

SODA, CAUSTIC.—76/77%, £21 7s. 6d. per ton; 70/72%, £19 17s. 6d. per ton; 60/62%, broken, £21 2s. 6d. per ton; 98/99%, powdered, £24 15s. per ton, ex station.

SODIUM ACETATE.—Remains unchanged at about £24 10s. per ton, ex wharf, but little demand.

SODIUM BICABONATE.—Refined recrystallised quality, £10 10s. per ton, ex quay or station. Mineral water quality, 30s. per ton less.

SODIUM BICHROMATE.—Unchanged at 4½d. per lb., delivered.

SODIUM CARBONATE.—Soda crystals, £5 to £5 5s. per ton, ex quay or station; alkali 58%, £8 16s. per ton, ex quay or station, spot delivery.

SODIUM CHLORATE.—Unchanged at about 3d. per lb.

SODIUM HYPOSULPHITE.—Commercial crystals offered at £9 per ton, ex wharf, early delivery; pea crystals, about £15 10s. per ton, ex station.

SODIUM NITRATE.—Refined 96/98%, unchanged at £13 10s. per con, f.o.r. or f.o.b. U.K.

SODIUM, NITRITE 100%.—£27 to £29 per ton, according to quantity.

SODIUM PRUSSIATE (Yellow).—Offered at 8d. per lb., ex store.

SODIUM SULPHATE (Saltcake 95%).—£4 per ton, ex station, for home consumption. Good export inquiry.

SODIUM SULPHIDE.—60/62% solid, £14 10s. per ton, ex quay, early delivery; broken, 20s. per ton more.

SULPHUR.—Flowers, £10 per ton; roll, £9 per ton; rock, £9 per ton; ground, £8 per ton; prices nominal.

TIN, CRYSTALS.—Unchanged at 1s. 4d. per lb.

ZINC SULPHATE.—English white commercial, £14 per ton; Continental, about £12.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

Coal Tar Intermediates and Wood Distillation Products

ACETANILIDE.—Small home inquiry. Price quoted, 1s. 11d. per lb., carriage paid.

BENZALDEHYDE.—Home inquiry. Price quoted, 2s. 11d. per lb., carriage paid.

BETA NAPHTHOL.—In small lots for the home trade, 1s. 2d. to 1s. 3d. per lb., delivered. In larger quantities, price 1s. 1d. per lb.

CHICAGO ACID.—Home inquiry. Price quoted, 16s. 8d. per lb., 100% basis, carriage paid.

DICHLORBENZOL.—Some home demand. Price quoted £62 per ton, carriage paid, drums included.

DIMETHYLANILINE.—Home inquiry. Price 3s. per lb., delivered.

DIPHENYLAMINE.—Home and export inquiries. Price 3s. 9d. to 4s. per lb., delivered.

METAPHENYLENEDIAMINE.—Small home inquiry. Price quoted, 5s. 6d. per lb., 100% basis.

PARAMIDOPHENOL HYDROCHLORIDE.—Export inquiry. Price, 8s. per lb., 100% basis.

PURE NAPHTHALENE POWDER.—Supplies are offered at £15 per ton, delivered, bags included.

TOLIDINE BASE.—Small home inquiry. Price, 7s. 3d. per lb., 100% basis, carriage paid.

Company News

MAZAPIL COPPER CO.—The directors announce that they are unable to declare a dividend for the past year. A debit balance of £49,432 is carried forward.

CASSEL CYANIDE CO.—The directors intimate that they have resolved to pay an interim dividend of 3d. per share less income-tax at 4s. 9d. per £. A similar dividend was paid at this time last year.

NITRATE PRODUCERS' STEAMSHIP CO.—The accounts for the year to April 30 last show a profit of £48,043, and £29,414 was brought in, making a total of £77,457. Meeting, 20, Billiter Buildings, London, E.C., on May 31, at 11.30 a.m.

THE NITRATE RAILWAYS CO., LTD.—The directors desire it to be known that the annual general meeting, usually held in May, will this year be held at a later date. Negotiations are now pending with the Chilean Government in regard to a consolidation of the company's concessions, and the directors desire if possible to be in a position to make a definite statement on the subject at the general meeting.

CORNISH KAOLIN.—The report for the year ended March 31 last states that rapid progress has been made with the programme of construction and equipment. At the commencement of the year production was resumed upon a small scale, and gradually increased concurrently with increasing sales, which amounted for the period to a total of 14,404 tons of clay. The accounts show a net profit of £435. Meeting, 20, Copthall Avenue, London, E.C., on May 29, at 2.30 p.m.

LAGUNAS NITRATE CO.—The trading for the year 1922, after charging £10,120 for repairs to maquina and stoppage expenses, and providing £10,043 for income tax, shows a loss of £8,435, against a profit of £21,133 for 1921. After deducting the loss from the balance from the previous account, there remains £32,352, from which it is proposed to pay a dividend of 2s. per share, tax free, being the same as for 1922. The oficina, the report states, was reopened in October last, and the working results have been very satisfactory.

ZINC CORPORATION, LTD.—The directors have declared a dividend of 2s. per share on the preference shares, being the second half of the fixed preferential dividend of 20 per cent. for the year 1922, payable on July 2, less tax. At the forthcoming annual general meeting the directors will recommend the declaration of a final participating dividend of 1s. per share on both the preference and the ordinary shares out of the profits for the year 1922, payable July 2, less tax. The last previous payment on the ordinary shares was 30 per cent. for 1918.

Tariff Changes

DENMARK.—A new import schedule for "luxuries" provides for the following duties :—

Electric machines (dynamos, generators, motors and converters), also magnet steel, stators, armatures, rotors, commutators, and magnet coils therefor, 7½ per cent. *ad valorem*.

Other machines and machine parts, 5 per cent. *ad valorem*. Machines are classed under this heading, even if they are imported "knocked down" and whether they are imported in one or several consignments and are presented for clearance at different times. Machine parts are dutiable, at the importer's option, at 5 per cent. *ad valorem* or according to kind.

Note.—The importer must state whether he wishes the goods to pay duty *ad valorem*, or according to description, before the Customs proceedings begin. On the importation of machine parts which it is desired to clear according to description, the Customs authorities may require the importer to give a written declaration, on oath, that the parts do not, in combination with consignments already cleared or arriving later, constitute one or more complete (or practically complete) machines.

All unspecified manufactures of common metals other than iron or steel (including common braziers', pewterers', zinc-founders'. and coppersmiths' wares) ; of aluminium, Kr. 0.45 per kilog ; other kinds, Kr. 0.30 per kilog.

Spirituous and etheric extracts and essences not perfumed ; ether dissolved in spirit ; fruit ether and ethers alone or in combination, except amylacetate, suitable for the preparation of beverages and refreshments, or for the production of fruit ethers as follows :—Extracts, etc., of vanilla, vanillin and saffron, 20 Kr. per kilog ; other extracts, 1 Kr. per kilog.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

LOCALITY OF FIRM OR AGENT.	MATERIAL.	REF. No.
Denmark	Oils and fats used in the margarine and soap-making industries.	673
Spain	Phosphates, potash and heavy chemicals.	679
Spain	Surgical instruments.	7424/22/ F.L./C.C

Evans, Sons, Lescher and Webb, Ltd.

THE twenty-first annual meeting of Messrs. Evans, Sons, Lescher and Webb, Ltd., manufacturing chemists, was held on Friday, May 18, in the Law Association Rooms, Cook Street, Liverpool.

Mr. J. Herbert E. Evans (chairman), who presided over a large attendance of shareholders, in proposing the adoption of the report and accounts, said twelve months ago their accounts showed a trading loss for 1921 of £384,247. For 1922 the trading loss was £86,382. They must not be unduly discouraged by the result of last year's trading.

It was resolved to concentrate in Liverpool as much of the company's business as could be conveniently transacted from the one centre. As a result of that decision the factory at Willesden was closed down early in the year, the plant removed to Liverpool, and the work absorbed in their Liverpool factories. It was also decided to transfer to Liverpool the very considerable export trade which had hitherto been dealt with in London. To-day everything was working smoothly, and a material saving in running expenses was showing itself.

The company was unique in the trade in respect to the number and variety of the products of its own manufacture. An indication of the improved condition of their business was the fact that since January 1st they had been able to employ their staff on full time instead of the part time worked during 1922.

The trading loss did not represent only the normal result of the year's trading, but included also bad debts, heavy charges for interest, depreciation in value of stocks, etc., and many expenses in connection with the consolidation of the business.

"The position indicates," said Mr. Evans, "that the corner has been turned. That statement is not made rashly ; it is made as the result of a very careful examination of the facts to-day, and a very careful survey of the possibilities of the future. It would not have been made unless I and my fellow-directors honestly believed that, so far as it is possible for human judgment and anticipation to forecast, it would be proved. To-day we are busy with home and export business to the full capacity of our staff."

Swiss Dyestuff Profits

THE balance-sheet just issued by the Society of Chemical Industry, Basle, the largest of the Swiss makers of coal-tar colours, shows a net profit of £106,000, as against £64,000 last year. The capital is £800,000, and there are loans to the amount of £1,080,000. It is proposed to pay a dividend of 12 per cent., as against 7 per cent. The report states that the demand during the financial year was decidedly greater than during its predecessor, but there were more difficulties in effecting sales in what were previously the company's best markets than ever before. In England the system of import licences is being much more strictly enforced than formerly, and in the United States the high import duties are a decidedly more serious handicap to foreign producers than the previous import regulations. The acquisition of English works—in which other Swiss dyestuff manufacturers are also financially interested—has proved of decided value ; but, on the other hand, the colour works in Cincinnati have so far been unprofitable.

THE BRITISH ALIZARINE COMPANY LTD.

Manchester London Glasgow

Manufacturers of Alizarine Dyestuffs

ALIZARINE RED (all shades)

ALIZARINE BLUES (soluble and insoluble)

ALIZARINE BORDEAUX

ALIZARINE CYANINE

ALIZARINE GREEN (soluble and insoluble)

ALIZARINE ORANGE

ALIZARINE RED S. POWDER

ALIZARINE BLUE BLACK

ALIZARINE (MADDER) LAKES (of all qualities)

ALIZARINE MAROON

ALIZUROL GREEN (Viridine)

ANTHRACENE BROWN

ALIZANTHRENE BLUE

ALIZANTHRENE BROWN

ALIZANTHRENE YELLOW

Other fast colours of this series in course of preparation

Anthraquinone, Silver Salt and all intermediates of this series

---

CHROME TANNING and other Chrome Compounds

TELEPHONES
663 Trafford Park, MANCHESTER
560 EAST LONDON
1667 DOUGLAS, GLASGOW

TELEGRAMS
BRITALIZ MANCHESTER
BRITALIZ LONDON
BRITALIZ GLASGOW

All communications should be addressed to

The British Alizarine Co., Ltd.
Trafford Park, Manchester

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgments

[NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.]

BLUNT, W. H., AND SON, Snow Hill, Birmingham, wholesale chemists. (C.C., 26/5/23.) £20 4s. 6d. April 9.

RADFORD, Francis Wilfred, 42, South Castle Street, Liverpool, merchant and soap manufacturer. (C.C., 26/5/23.) £15 6s. 11d. April 9.

ST. STEPHEN'S MANUFACTURING CO., LTD., 3, St. Stephen's Street, Hull, manufacturing chemists. (C.C., 26/5/23.) £15 5s. 6d. April 9.

Receivership

TURNER DRUG AND GALENICAL CO., LTD. (R. 26/5/23.) F. T. Fogden, of 6, Palmeira Mansions Westcliff-on-Sea, was appointed receiver and manager by Order of Court dated May 4, 1923.

Mortgages and Charges

*[NOTE.—The Companies Consolidation Act, of 1908, provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.]*

BOOTH (ALFRED) (NEW BRIGHTON), LTD., chemists. (M., 26/5/23.) Registered May 8, £750 debenture, to J. C. Hall, 293, Union Street, Aberdeen, chemist; general charge. *——. May 5, 1922.

GERMINOL PRODUCTS, LTD., London, S.W., manufacturing chemists. (M., 26/5/23.) Registered May 5, £600 debentures; general charge. *Nil. September 15, 1922.

Satisfaction

CORBYN, STACEY AND CO., LTD., London, E., chemists. (M.S., 26/5/23.) Satisfaction registered May 10, all moneys, etc., registered October 22, 1914.

London Gazette

Company Winding Up Voluntarily

ST. STEPHEN'S MANUFACTURING CO., LTD. (C.W.U.V., 26/5/23.) C. W. Preston, incorporated accountant, Hull, appointed liquidator.

Application for Discharge

DE CESARI, Enea, 9, Ampthill Square, Hampstead Road, London, N.W.1, manufacturer of vermin killer. (A.F.D., 26/5/23.) Hearing, June 6th, 11 a.m., Bankruptcy Buildings, Carey Street, London, W.C.2.

Bankruptcy Information

PHILLIPPS, Elsie Irene, 668, Fishponds Road, Fishponds, Bristol, lately carrying on business at 18, St. Mary's Row, Moseley, Birmingham, pharmacist (spinster). First meeting, May 30, 11.30 a.m., Official Receiver's Offices, 26, Baldwin Street, Bristol. Public examination, June 8, 12 noon, Guildhall, Bristol.

New Companies Registered

R. W. BROOKE AND CO., LTD., 36, Dale Street, Liverpool. Manufacturers of mastic varnish and other chemicals. Nominal capital, £5,000 in £1 shares (1,000 cumulative 5 per cent. preference).

MANCHESTER MACHINE AND INSTRUMENT MANUFACTURING CO., LTD., 2, Booth Street, Manchester. Manufacturers of and dealers in scientific and general instruments, chemicals, etc. Nominal capital, £1,000 in £10 shares.

J. E. WAILES AND CO., LTD., Cailes Buildings, Quayside, Newcastle-on-Tyne. Manufacturers of chemicals and manures; distillers, dye makers, etc. Nominal capital, £6,000 in £100 shares.

Amalgamation of Japanese Fertiliser Companies

THE Commercial Counsellor at Yokohama (Sir E. T. F. Crowe, C.M.G.) has forwarded to the Department of Overseas Trade a report, furnished by a reliable source, on the amalgamation of three fertiliser companies, *viz.*, The Japan Artificial Fertiliser Co. (Dai Nihon Jinzo Hiryo Habushiki Kaisha), the Eastern Acid and Alkali Co. (Kanto Sanso, K.K.) and the Japan Chemical Fertiliser Co. (Nihon Kagaku Hiryo, K.K.).

The report states that the question of the amalgamation of artificial fertiliser companies has frequently been to the fore since the slump of 1920. At that time, however, companies had a certain surplus in hand from the boom period, and it was not found possible to arrange mutually satisfactory terms of amalagamation, but as time went on the artificial fertiliser market went from bad to worse, and companies tried to offset this condition by various expedients, positive and negative, such as by increasing their output to lower the cost of production, or by limiting production to maintain the market. This brought about no amelioration of the situation: goods continued to accumulate and the market remained lifeless. Moreover, the price of rice and other cereals being low, the purchasing power of farmers was small and goods continued to pile up.

These and similar considerations led the three large companies, the Japan Artificial Fertiliser Co., the Kanto Acid and Alkali Co., and the Japan Chemical Fertiliser Co., seriously to consider the question of amalagmation, which is on the point of completion through the good offices of the veteran business man Viscount Shibusawa. The three companies concluded the preliminary agreement on January 15. An extraordinary general meeting of shareholders was called for January 31, when the terms of amalgamation, based on the preliminary agreement, were submitted for adoption.

On the amalgamation of the Japan Artificial Fertiliser Co., the Kanto Acid and Alkali Co., and the Japan Chemical Fertiliser Co., the two last were dissolved, the Japan Artificial Fertiliser Co. continuing with modification of its capital.

Prior to amalgamation the Japan Artificial Fertiliser Co. was to decrease its present capital of Yen 14,300,000 (paid up) to Yen 10,010,000, and then by the addition of Yen 12,390,000 the capital of the new company was to be brought up to Yen 22,400,000 (paid up). Against this increase of capital 247,800 shares were to be distributed on April 30, 1923, to the present shareholders of the Kanto Acid and Alkali and the Japan Chemical Fertiliser companies in the following proportions:—

(*a*) The Kanto Acid and Alkali Co. was to receive 35,700 shares of the new company for 30,000 of its old shares and 83,300 shares of the new company for 70,000 of its new shares, which would be fully paid up by February 15 last. That is to say, the number of shares to be distributed to the Kanto Co.'s shareholders is 119,000 shares valued at Yen 5,950,000.

(*b*) The Japan Chemical Fertiliser Co. was to receive 11,500 shares of the new company for 20,000 of its old shares and 117,300 shares of the new company for 240,000 of its new shares, which were paid up to the value of Yen 42.50 per share on February 1. Moreover, it received Yen 6,000 in cash for its 20,000 old shares and Yen 61,200 for its 240,000 new shares. That is to say, the shareholders of the Japan Chemical Fertiliser Co. will receive 128,800 shares and Yen 67,200 in cash. This is equivalent to a total of Yen 6,507,200.

The amalgamation was set to take place on May 1, 1923.